



# HIGHLANDS COUNTY BOARD OF COUNTY COMMISSIONERS

## HEALTH DEPARTMENT- HVAC UPGRADE AND ADA RESTROOM/SHOWER. PROJECT # 16065

SWEET SPARKMAN  
ARCHITECTS

7205 S GEORGE BLVD.  
SEBRING, FLORIDA, 33870



VICINITY PLAN  
NTS

### TABLE OF CONTENTS

COVER

### ARCHITECTURAL

- A0.1 CODE ANALYSIS, LIFE SAFETY PLAN & LEGENDS
- A2.1 ENLARGED FLOOR PLANS & DETAILS
- A4.1 DETAILS, INTERIOR ELEVATIONS & NOTES

### MECHANICAL

- M1.0 MECHANICAL NOTES, SCHEDULES AND LEGENDS
- M2.0 DEMOLITION FLOOR PLAN
- M2.1 PARTIAL MECHANICAL FLOOR PLAN
- M2.2 PARTIAL MECHANICAL FLOOR PLAN
- M2.3 ENLARGED MECHANICAL FLOOR PLANS
- M3.0 MECHANICAL DETAILS

### ELECTRICAL

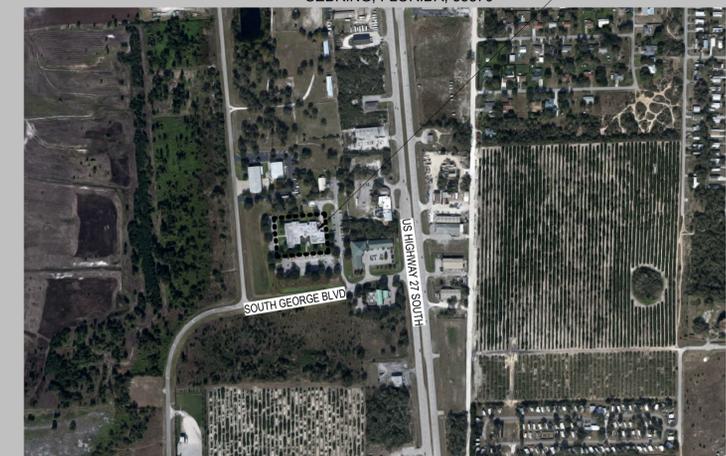
- E1.0 ELECTRICAL NOTES AND SCHEDULES
- E2.0 ELECTRICAL DEMOLITION FLOOR PLAN
- E3.1 ELECTRICAL FLOOR PLAN - WEST
- E3.2 ELECTRICAL FLOOR PLAN - EAST
- E4.0 POWER RISER DIAGRAM
- E5.0 GENERATOR SPECIFICATION
- E5.1 GENERATOR SPECIFICATION
- E6.0 PANELBOARD SCHEDULES
- E6.1 PANELBOARD SCHEDULES

### PLUMBING

- P1.0 PLUMBING NOTES, SCHEDULES AND LEGEND
- P2.0 PARTIAL PLUMBING FLOOR PLAN

### SITE LOCATION MAP

7205 S GEORGE BLVD.  
SEBRING, FLORIDA, 33870



NOTE: THE SCALE OF THESE PLANS MAY HAVE  
CHANGED DUE TO REPRODUCTION

### OWNER

HIGHLANDS COUNTY BOARD OF  
COUNTY COMMISSIONERS  
7205 S GEORGE BLVD  
SEBRING, FL, 33870  
MS. SUZANNE HUNNICUTT  
CAPITAL PROJECTS MANAGER  
863.402.6932 PHONE  
FAX

### ARCHITECT

SWEET SPARKMAN ARCHITECTS  
2168 MAIN STREET  
SARASOTA, FLORIDA 34237  
CONTACT: TODD M. SWEET, AIA, LEED AP  
PRINCIPAL & PROJECT MANAGER  
941.952.0084 PHONE  
941.952.0201 FAX

### MEP ENGINEER

PYRAMID ENGINEERING  
5596 RIO VISTA DRIVE  
CLEARWATER, FLORIDA, 33760  
CONTACT: MICHAEL CURKAN, PE  
PRESIDENT / PRINCIPAL  
727.531.2989 PHONE  
941.748.1349 FAX

HIGHLANDS COUNTY BOARD OF COUNTY COMMISSIONERS - HEALTH DEPARTMENT- HVAC  
UPGRADE AND ADA RESTROOM/SHOWER. PROJECT # 16065  
18498 - 100% CONSTRUCTION DOCUMENTS - 09/18/18

**CODE ANALYSIS**

**RENOVATION SCOPE**

THE WORK INCLUDES :  
 A. ONE FOR ONE REPLACEMENT OF EXISTING MECHANICAL CONDENSERS AND SELECT VAVS. EXISTING DUCTWORK TO REMAIN.  
 B. MINOR INTERIOR RENOVATION AS SHOWN TO ACCOMMODATE (1) NEW ACCESSIBLE RESTROOM WITH SHOWER AND (1) NEW OFFICE.  
 C. (1) NEW TANK MOUNTED STANDBY DIESEL GENERATOR WITH AUTOMATIC TRANSFER SWITCH ON CONCRETE PAD.  
 D. EXISTING FINISHES TO REMAIN EXCEPT FOR RENOVATION SCOPE AREA

**GROSS BUILDING AREA**

TOTAL BUILDING GROSS SF 25,300 GSF  
 INTERIOR RENOVATION AREA 255 SF (1%) MECH RENOVATIONS THROUGHOUT

**APPLICABLE CODES**

BUILDING CODE: FLORIDA BUILDING CODE FBC 2017 WITH APPLICABLE AMENDMENTS  
 MECHANICAL CODE: FBC, MECHANICAL 2017 WITH APPLICABLE AMENDMENTS  
 ENERGY CONSERVATION: FBC, ENERGY CONSERVATION 2017 WITH APPLICABLE AMENDMENTS  
 ELECTRICAL CODE: FBC - CHAPTER 27, NFPA 70 (N.E.C.) WITH APPLICABLE AMENDMENTS  
 PLUMBING CODE: FBC, PLUMBING 2017 WITH APPLICABLE AMENDMENTS  
 FUEL GAS CODE: FBC, FUEL GAS 2017 WITH APPLICABLE AMENDMENTS  
 ACCESSIBILITY CODE: 2017 FLORIDA ACCESSIBILITY CODE FOR BUILDING CONSTRUCTION  
 FIRE SAFETY CODE: FLORIDA FIRE PREVENTION CODE, 5TH EDITION WITH APPLICABLE AMENDMENTS  
 OTHER: FBC, EXISTING BUILDING CODE 2017

**BUILDING CATEGORIZATION & PHYSICAL PROPERTIES**

OCCUPANCY CLASSIFICATION	FLORIDA BUILDING CODE	FLORIDA FIRE PREVENTION CODE
	CHAPTER 3, SECTION 302	CHAPTER 6
GROUP BUSINESS [B]	BUSINESS	
CONSTRUCTION TYPE	CHAPTER 6	TABLE A8.2.1.2
EX. BUILDING CODE - ALTERATION LEVEL	LEVEL 2 ALTERATIONS - RECONFIGURATION OF SPACE	
WIND LOADS (FBC CHAPTER 16)	FBC CHAPTER 16	RISK CATEGORY TABLE 1604.5
	150 MPH	III
BUILDING PHYSICAL PROPERTIES	CHAPTER 5 - TABLE 503	NFPA 101, PER OCCUPANCY TYPE (CHAPTERS 12-43)
MAXIMUM HEIGHT IN FEET	75 FEET	--
MAXIMUM NUMBER OF STORIES	3 STORIES	--
ALLOWABLE BUILDING AREA	69,000 SQ FT	N/A
SPRINKLER SYSTEM	EXISTING FIRE SPRINKLER PROVIDED.	

**EXITING REQUIREMENTS**

EXITING COMPONENT	FLORIDA BUILDING CODE	FLORIDA FIRE PREVENTION CODE NFPA 101 - LIFE SAFETY CODE	PROVIDED
COMMON PATH OF TRAVEL TO AN EXIT	75 FEET	75 FEET	< 60 FEET
MAXIMUM DEAD END CORRIDOR	20 FEET	20 FEET	N/A
MAXIMUM TRAVEL DISTANCE TO EXIT	250 FEET	250 FEET	< 80 FEET
MINIMUM CORRIDOR WIDTH	44 INCHES	44 INCHES	> 44"
MINIMUM CLEAR OPENING OF EXIT DOORS	32 INCHES	32 INCHES	> 32"

**OCCUPANCY LOAD AND EGRESS WIDTH CALCULATIONS** (MOST STRINGENT CODE CRITERIA LISTED AND CALCULATED BELOW)

AREA(SF)	OCCUPANT USE	AREA PER OCCUPANT (SF)	OCCUPANT LOAD	REQ'D EGRESS WIDTH	EGRESS WIDTH PROVIDED
NON-STAIR EGRESS					
SEE LIFE SAFETY PLAN (TYP FOR ALL)		< 49	NO CHANGE	34" NO CHANGE	

**PLUMBING FIXTURE CALCULATION**

FIXTURE COUNT	OCC. LOAD	WC REQUIRED	WC PROVIDED	LAV REQUIRED	LAV PROVIDED	MOP SINK REQUIRED	MOP SINK PROVIDED	DRINKING FOUNTAIN REQ'D	DRINKING FOUNTAIN PROVIDED
OCCUPANCY GROUP [B] NO CHANGE TO EXISTING									
<b>REMARKS:</b> 1. NO DECREASE IN EXISTING FIXTURES (1) ADDED LAV (1) ADDED WC.									

**FIRE EXTINGUISHER REQUIREMENTS**

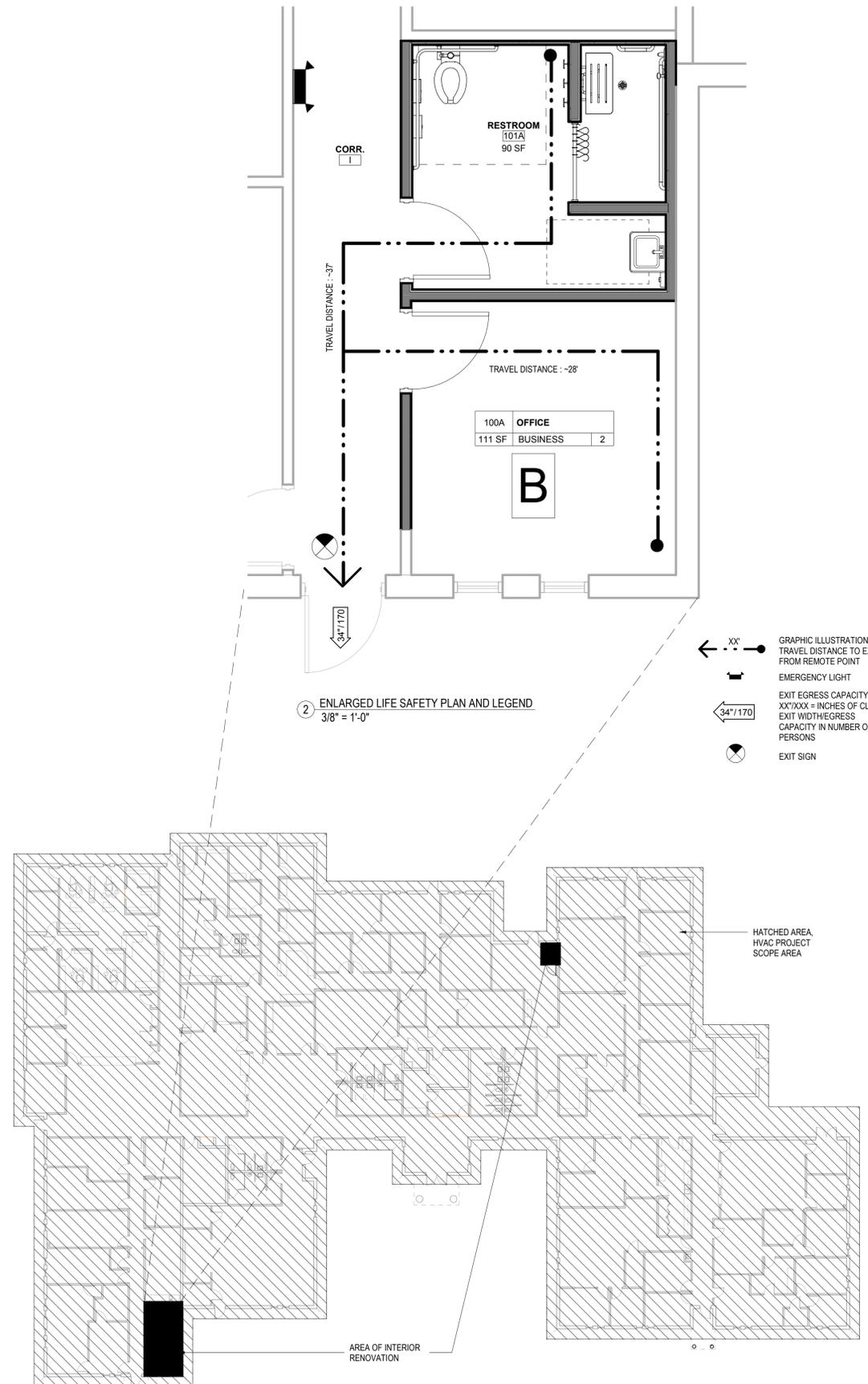
FIRE EXTINGUISHER COMPONENT	FLORIDA BUILDING CODE	NFPA 10, TABLE 5.2.1 PER HAZARD OCCUPANCY	PROVIDED
MAXIMUM FLOOR AREA PER UNIT OF A	1500 SQ FT	1500 SQ FT	REMARK 1
MAXIMUM FLOOR AREA PER EXTINGUISHER	11,250 SQ FT	11,250 SQ FT	--
MAXIMUM TRAVEL DISTANCE	75 FEET	75 FEET	< 75 FEET
<b>REMARKS:</b> 1. NO CHANGE TO EXISTING			

**ABBREVIATIONS**

ABV	ABOVE	MECH	MECHANICAL
AC, A/C	AIR CONDITIONING	MO	MASONRY OPENING
ACT	ACOUSTIC CEILING TILE	MR	MOISTURE-RESISTANT
AF	ACCESS FLOORING	MUA	MAKE-UP AIR
AFB	ABOVE FINISHED FLOOR	N	NOSING
BOD	BOTTOM OF DECK	NIC	NOT IN CONTRACT
BOF	BOTTOM OF FOOTING	NR	NONE REQUIRED
BOS	BOTTOM OF STEEL	NS	NEAR SIDE
BS	BOTH SIDES	NTS	NOT TO SCALE
BSE	BRICK SHELF ELEVATION	OC	ON CENTER
C	CHANNEL	PA	PUBLIC ADDRESS
CB	COVE BASE	PAF	POWER-ACTUATED FASTENER
CEM BD	CEMENTITIOUS BACKER BOARD	PC	PRECAST CONCRETE
CFM	CUBIC FEET PER MINUTE	PCP	PORTLAND CEMENT PLASTER
CJ	CONTROL JOINT; CONSTRUCTION JOINT	PL	PLATE
CMU	CONCRETE MASONRY UNIT	PLM	PLASTIC LAMINATE
COL	COLUMN	PLF	POUNDER PER LINEAR FOOT
CONC	CONCRETE	PT	PAINT/PAINTED
CRPT	CARPET	PP	POWER PANEL
CT	CERAMIC TILE	PROT	PROTECT
CT-S	CERAMIC SHOWER TILE	PSF	POUNDS PER SQUARE FOOT
CU	AIR CONDITIONING CONDENSER UNIT	PSI	POUNDS PER SQUARE INCH
CUH	CABINET UNIT HEATER	PT	PRESSURE-TREATED; PORCELAIN TILE
DF	DRINKING FOUNTAIN	PTD	PAPER TOWEL DISPENSER
EF	EXHAUST FAN; EACH FACE	PVC	POLYVINYL CHLORIDE
EJ	EXPANSION JOINT	R	RISER, RADIUS
ELEC	ELECTRICAL	RAF	RESILIENT ATHLETIC FLOORING
EP	EPOXY PAINT	RB	RUBBER BASE
ESS	EXTERIOR SOFFIT SYSTEM	RBF	RUBBER FLOORING
EW	EACH WAY	RD	ROOF DRAIN
EWC	ELECTRIC WATER COOLER	RES	RESILIENT
EX	EXISTING	RO	ROUGH OPENING
EXP	EXPOSED	RTU	ROOF TOP UNIT (HVAC)
FAAP	FIRE ALARM ANNUCIATOR PANEL	SC	SEALED CONCRETE
FACP	FIRE ALARM CONTROL PANEL	SF	SQUARE FOOT; SUPPLY FAN
FB	FLAT BAR	SN	SANITARY NAPKIN (DISPENSER)
FBO	FURNISHED BY OTHERS	SS	STAINLESS STEEL
FCO	FLOOR CLEAN-OUT	STR	STRUCTURAL
FD	FLOOR DRAIN		
FEC	FIRE EXTINGUISHER CABINET		
GB	GRAB BAR	ULPP	UNDER LAVATORY PIPE PROTECTION
GC	GENERAL CONTRACTOR	UNO	UNLESS NOTED OTHERWISE
GV	GRAVITY VENT	V	VENT PIPE
GYP	GYPSUM WALL BOARD	VB	VAPOR BARRIER
		VCT	VINYL COMPOSITION TILE
		VIF	VERIFY IN FIELD
		VTR	VENT THROUGH THE ROOF
		VWC	VINYL WALL COVERING
		W	WIDE, WASHER
		WC	WATER CLOSET
		WH	WATER HEATER

**SYMBOLS**

	SECTION
	DETAIL
	INTERIOR ELEVATION
	LEVEL LINE
	DRAWING NOTE
	WALL TAG
	DOOR TAG
	ROOM NAME ROOM NUMBER
	TOILET ACCESSORY TAG
	DIRECTION OF SLOPED SURFACE



1 FIRST FLOOR KEY PLAN  
1" = 20'-0"

2 ENLARGED LIFE SAFETY PLAN AND LEGEND  
3/8" = 1'-0"



SPARKMAN ARCHITECTS  
2168 MAIN STREET  
SARASOTA, FL 34237

SWEET T 941.962.0084  
F 941.962.0201  
FL AA26000857

TODD SWEET, AIA, LEED AP  
FL LIC. # 001932



HIGHLANDS COUNTY BOARD OF COUNTY COMMISSIONERS  
HEALTH DEPARTMENT- HVAC UPGRADE AND ADA  
RESTROOM SHOWER, PROJECT # 16065  
SEBRING, FLORIDA, 33870

ISSUED FOR: 100% CONSTRUCTION DOCUMENTS  
09/18/18

REV	DESCRIPTION	DATE

GRAPHIC SCALE:  
0" 1"

SCALE: As indicated

PROJECT MANAGER: TMS

DRAWN BY: CKF

A/E OF RECORD: TMS

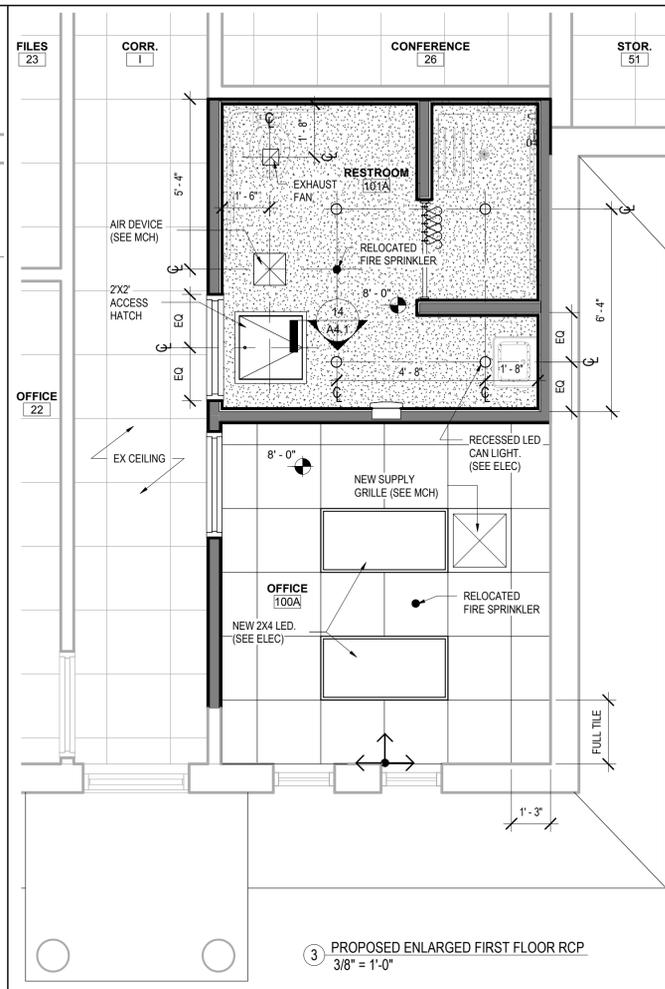
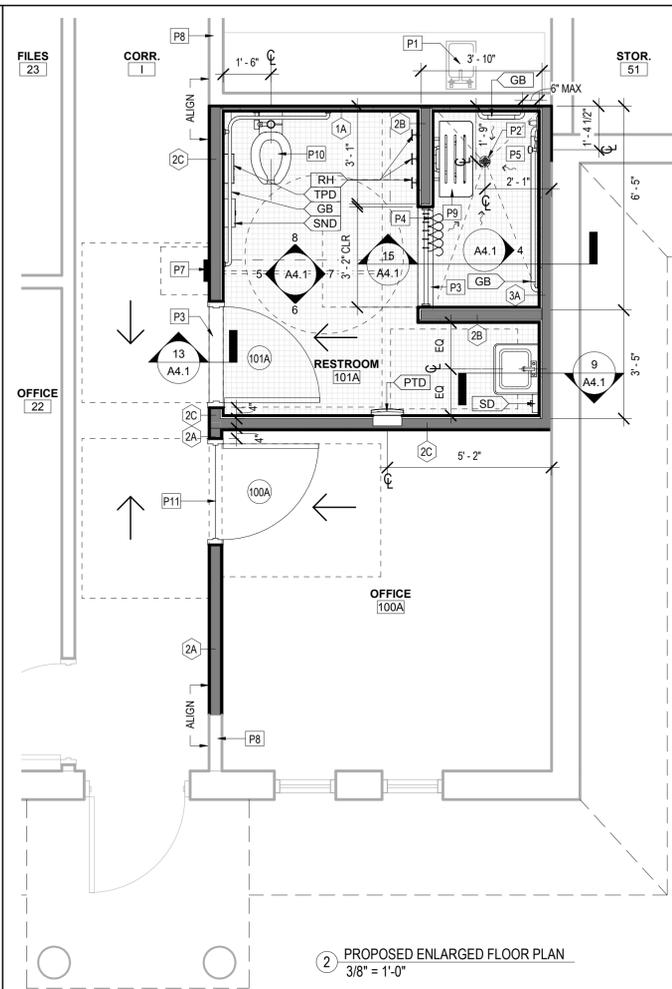
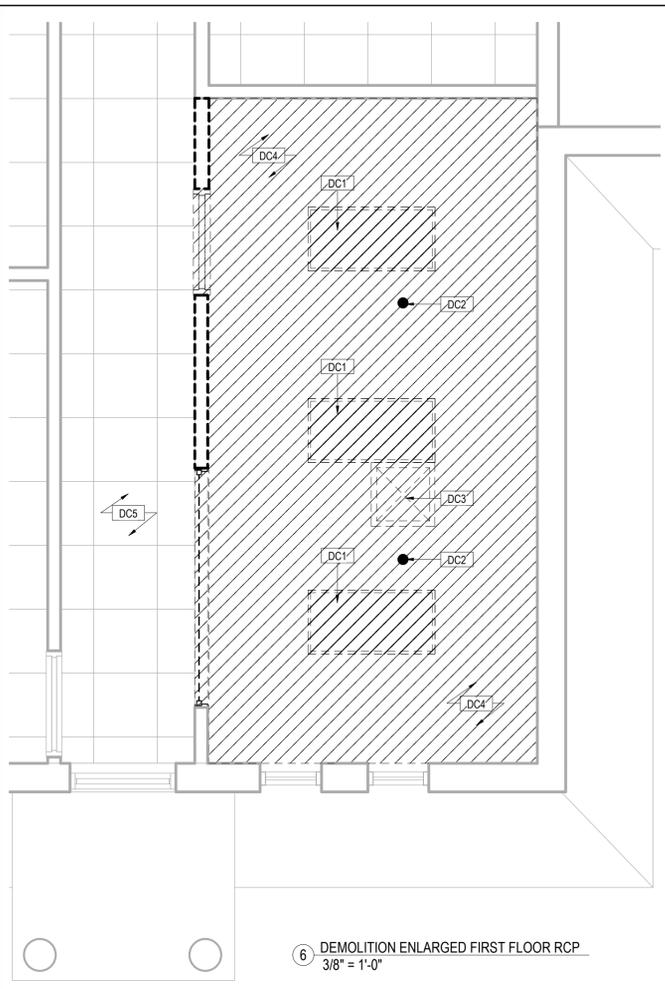
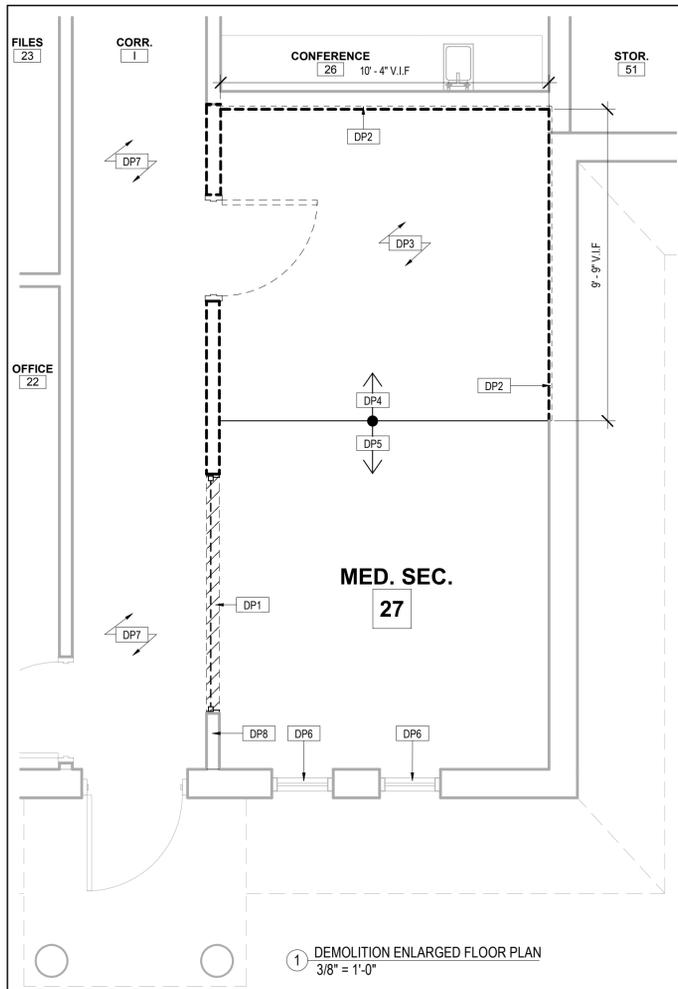
PROJECT NO: 18498

SHEET TITLE:

CODE ANALYSIS,  
LIFE SAFETY PLAN &  
LEGENDS

SHEET No.:  
**A0.1**

© COPYRIGHT 2018 SWEET SPARKMAN ARCHITECTS, INC.



**DEMO NOTES:**

**NOTE:** THE INTENT OF THE DRAWINGS AND SPECIFICATIONS IS TO PROVIDE FOR A WATERTIGHT & WEATHERTIGHT BUILDING. THE CONTRACTOR SHALL REVIEW ALL DETAILS RELATING TO THIS INTENT AND BY BIDDING OR ENTERING INTO THIS CONSTRUCTION CONTRACT WARRANTS FOR ONE FULL YEAR THE ADEQUACY OF THESE DETAILS. SHOULD THE CONTRACTOR TAKE EXCEPTION TO THESE DETAILS, HE SHALL NOTIFY THE ARCHITECT PRIOR TO BIDDING. ANY DEVIATION FROM THIS GENERAL INTENT SHOULD BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR CLARIFICATION.

**GENERAL NOTES:**

- THE INTENT OF THE DRAWINGS AND SPECIFICATIONS IS TO PROVIDE FOR A PLUMB, LEVEL, AND SQUARE STRUCTURE UNLESS OTHERWISE NOTED. ANY DEVIATION FROM THIS GENERAL INTENT SHOULD BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR CLARIFICATION.
- THE BUILDING SHALL BE CONSTRUCTED IN FULL COMPLIANCE WITH ALL APPLICABLE CODES, ORDINANCES AND REGULATIONS AS WELL AS THE DRAWINGS AND SPECIFICATIONS. ANY CODE DEFICIENCIES IN THE DRAWINGS RECOGNIZED BY THE CONTRACTOR SHOULD BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR CLARIFICATION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCURATE PLACEMENT OF THE WALLS IN THE BUILDING AND VERIFY ALL DIMENSIONS AND EX CONDITIONS, DISCREPANCIES BETWEEN DRAWINGS AND ACTUAL FIELD CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT BEFORE BIDDING OR THE COMMENCEMENT OF WORK. THE OWNER SHALL NOT BE RESPONSIBLE FOR CHANGES TO THE WORK DUE TO THE FAILURE OF THE CONTRACTOR TO FAMILIARIZE HIMSELF WITH EX CONDITIONS.
- THE CONTRACTOR SHALL PROVIDE ALL PERMITS AND INSPECTION NECESSARY FOR THE PROPER EXECUTION OF THE WORK IN ACCORDANCE WITH APPLICABLE CODES AND GOVERNING REGULATIONS.
- CONTRACTOR TO FURNISH AND INSTALL CONCEALED SUPPORT FRAMING (WITHIN WALLS) AS REQUIRED TO FIRMLY SECURE WALL MOUNTED EQUIPMENT AND/OR ACCESSORIES. WOOD BLOCKING SHALL COMPLY WITH THE REQUIREMENTS OF FBC BUILDING SECTION 603 FOR COMBUSTIBLE MATERIAL IN TYPE I CONSTRUCTION.
- CONTRACTOR SHALL PROTECT PIPES WITHIN CONCEALED WALL CAVITIES WITH NAIL-FASTENER PROTECTION (FROM POTENTIAL PUNCTURE) FROM FINISHED SIDES OF WALL.
- THE CONTRACTOR SHALL VERIFY THE SIZES AND LOCATIONS OF ALL MECHANICAL AND ELECTRICAL EQUIPMENT PADS AND BASES, AS WELL AS POWER, WATER AND DRAIN REQUIREMENTS FOR SUCH EQUIPMENT WITH EQUIPMENT MANUFACTURER. DEVIATION OF THE AFOREMENTIONED REQUIREMENTS SHOULD BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR CLARIFICATION.
- MINIMUM THICKNESS OF WEATHER COATINGS SHALL BE PROVIDED UNLESS SPECIFIED THICKER PER FBC TABLE 1405.2.

**DEMOLITION NOTES**

- DEMOLITION NOTES APPLY ONLY TO THE DEMOLITION PLAN.
- PRESERVE ALL EX DUCTWORK, FIRE SPRINKLERS, ELECTRICAL CONDUIT, AND PLUMBING SUPPLY/VENT/WASTE LINES WHERE NOT OTHERWISE DISTURBED.
- REMOVE AND PROTECT WALL MOUNTED FIXTURES AS REQUIRED FOR NEW PAINTING.
- FLOOR MOUNTED ELECTRICAL FIXTURES TO BE REMOVED, PROTECTED & REUSED.
- DEMOLITION FLOOR PLAN AREAS WITH NO DEMOLITION INSTRUCTION ARE TO REMAIN EX U.N.O.
- PROPOSE AND COORDINATE WITH THE OWNER A TIME SCHEDULE OF ALL WORK TO BE DONE.
- BEFORE ANY DEMOLITION BEGINS, SURVEY EX CONDITIONS AND INFORM THE ARCHITECT OF ANY DISCREPANCIES IN THE DEMOLITION PLAN.
- PROTECT THE WORK TO REMAIN. DAMAGE TO EX WORK, MATERIALS AND EQUIPMENT AS A RESULT OF OPERATIONS SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE ARCHITECT & OWNER. ALL DAMAGE TO EX WORK, MATERIAL AND FINISH SHALL BE REPLACED BY THE CONTRACTOR WITH MATERIALS OF LIKE TYPE, QUALITY AND FINISH BY SKILLED MECHANICS OF THE TRADES INVOLVED AT NO ADDITIONAL COST TO THE OWNER.
- PROTECTION OF PERSONS AND PROPERTY SHALL BE PROVIDED THROUGHOUT THE PROGRESS OF THE WORK. THE WORK SHALL PROCEED IN SUCH A MANNER AS TO MINIMIZE THE SPREAD OF DUST AND FLYING PARTICLES AND TO PROVIDE SAFE WORKING CONDITIONS FOR PERSONNEL. ALL NECESSARY BARRIERS AND WARNING SIGNS SHALL BE PROVIDED AS REQUIRED BY THE BUILDING AUTHORITIES.
- REMOVE ALL DEBRIS FROM THE SITE DAILY AND LEAVE THE SITE IN AN ORDERLY MANNER.
- ALL STRUCTURAL COLUMNS AND/OR BEARING WALLS MAY NOT BE LOCATED ON THE DEMOLITION PLAN. VERIFY ALL MEASUREMENTS AND LOCATIONS OF STRUCTURAL ELEMENTS THAT ARE ASSOCIATED WITH THE DEMOLITION SCOPE OF WORK. ANY STRUCTURAL CONFLICTS SHOULD BE BROUGHT TO THE ATTENTION OF THE ARCHITECT IMMEDIATELY.
- ANY ROOF DRAIN OR UTILITY CONDUIT PIPES SHALL REMAIN UNLESS NOTED OTHERWISE.
- IF ANY EX BUILDING MATERIAL OR SUBSTANCE ENCOUNTERED IS SUSPECTED AS BEING HAZARDOUS, CONTACT THE OWNER & THE ARCHITECT IMMEDIATELY.
- PATCH AND LEVEL FLOOR AREAS SCHEDULED TO RECEIVE NEW FINISH.
- REMOVE AND CAP EX UNUSED ELECTRICAL OUTLETS, SWITCHES, FIXTURES, ETC. SEE MEP.
- ALL SALVAGED MATERIALS, UNLESS OTHERWISE NOTED SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

**WALL LEGEND**

EX WALLS

NEW STUD WALLS

**DEMO PLAN NOTES:**

KEYNOTES WITH "DP" BEFORE THE NUMBER PERTAIN TO THE DEMOLITION PLAN ONLY.

ALL "BOX" KEYNOTES ON THIS PLAN REFER TO THE DRAWING LIST BELOW.

**PROPOSED PLAN NOTES:**

KEYNOTES WITH "P" BEFORE THE NUMBER PERTAIN TO THE PROPOSED PLAN ONLY.

ALL "BOX" KEYNOTES ON THIS PLAN REFER TO THE DRAWING LIST BELOW.

**EXISTING SINK TO REMAIN**

**FLOOR DRAIN SEE PLUMBING**

**QUARTZITE ADA THRESHOLD**

**SHOWER CURTAIN COORD. WITH OWNER**

**SLOPE SHOWER FLOOR 1/4" TO DRAIN**

**ADA SIGNAGE**

**VERIFY EXISTING WALL ASSEMBLY. NEW WALL SHALL ALIGN WITH EXISTING AND MATCH SIZE. ANY DISCREPANCIES TO BE VERIFIED WITH ARCHITECT**

**FOLDABLE ADA SHOWER BENCH. SEE SPEC**

**NEW FLOOR MOUNTED FLUSH VALVE TOILET. SEE PLUMBING.**

**CPT TO CPT TRANSITION**

**DIMENSION NOTES**

- DO NOT SCALE DRAWINGS. ALL WRITTEN DIMENSIONS SHALL HAVE PREFERENCE OVER SCALE AND BE FIELD VERIFIED AND COORDINATED WITH WORK OF ALL TRADES. IF NO DIMENSIONS ARE GIVEN OR DISCREPANCIES FOUND, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT FOR CLARIFICATION BEFORE BIDDING OR COMMENCING THE WORK.
- DIMENSIONS TO EXTERIOR MASONRY WALLS ARE TO EXTERIOR FACE OF MASONRY, TYPICAL.
- DIMENSIONS LOCATING NEW INTERIOR STUD WALLS ARE TO FACE OF STUD, TYPICAL.
- OPENINGS NOT LOCATED BY DIMENSION IN INTERIOR WALLS, AND NOT ABUTTING ADJACENT WALLS ARE TO BE CENTERED ON THE WALL.
- CENTER ANY INTERIOR OPENINGS (NOT LOCATED BY DIMENSION), THAT APPEAR TO BE CENTERED IN A WALL.
- IF THE LOCATION OF ANY BUILDING ELEMENT IS NOT OBVIOUS OR CANNOT BE DETERMINED BY DIMENSION, MATHEMATICS, OR AS NOTED ABOVE, CONTACT THE ARCHITECT PRIOR TO LOCATING THE ELEMENT.

**STRUCTURAL NOTES:**

**GENERAL NOTES:** STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH JOB SPECIFICATIONS AND ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND SITE DRAWINGS. CONSULT THESE DRAWINGS FOR SLEEVES, DEPRESSIONS, AND OTHER DETAILS NOT SHOWN ON STRUCTURAL DRAWINGS.

ALL DIMENSIONS AND CONDITIONS MUST BE VERIFIED IN THE FIELD. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK.

SOIL SHALL BE TREATED FOR TERMITES WITH A REGISTERED TERMITICIDE PER THE REQUIREMENTS OF SECTION 1816 OF THE 2017 FLORIDA BUILDING CODE. UPON COMPLETION, THE CODE REFERENCED "CERTIFICATE OF COMPLIANCE" SHALL BE SUBMITTED TO THE BUILDING OFFICIAL BY A LICENSED PEST CONTROL COMPANY.

**CONCRETE:** SHALL BE PER AN APPROVED MIX DESIGN PROPORTIONED TO ACHIEVE A STRENGTH AT 28 DAYS AS LISTED BELOW WITH A PLASTIC AND WORKABLE MIX:

3000 psi FOR FOUNDATIONS AND SLABS ON GRADE.

CONCRETE SHALL BE PLACED AND CURED ACCORDING TO ALL STANDARDS AND SPECIFICATIONS.

SUBMIT PROPOSED MIX DESIGN WITH RECENT FIELD CYLINDER OR LAB TESTS FOR REVIEW PRIOR TO USE. MIX SHALL BE UNIQUELY IDENTIFIED BY MIX NUMBER OR OTHER POSITIVE IDENTIFICATION. MIX SHALL MEET THE REQUIREMENTS OF ASTM C39 FOR COARSE AGGREGATE. CONCRETE SHALL COMPLY WITH ALL THE REQUIREMENTS OF ASTM STANDARD C94 FOR MEASURING, MIXING, TRANSPORTING, ETC. CONCRETE TICKETS SHALL BE TIME STAMPED WHEN CONCRETE IS BATCHED.

THE MAXIMUM TIME ALLOWED FROM THE TIME THE MIXING WATER IS ADDED UNTIL IT IS DEPOSITED IN ITS FINAL POSITION SHALL NOT EXCEED ONE AND ONE HALF (1-1/2) HOURS. IF FOR ANY REASON THERE IS A LONGER DELAY THAN THAT STATED ABOVE, THE CONCRETE SHALL BE DISCARDED. IT SHALL BE THE RESPONSIBILITY OF THE TESTING LAB TO NOTIFY THE OWNER'S REPRESENTATIVE AND THE CONTRACTOR OF ANY NONCOMPLIANCE WITH THE ABOVE.

ALL SLABS SHALL BE CURED USING A DISSIPATING CURING COMPOUND MEETING ASTM STANDARD C309 TYPE 1-D AND SHALL HAVE A FUGITIVE DYE. THE COMPOUND SHALL BE PLACED AS SOON AS THE FINISHING IS COMPLETED OR AS SOON AS THE WATER HAS LEFT THE UNFINISHED CONCRETE. ALL SCURED OR BROKEN AREAS IN THE CURING MEMBRANE SHALL BE RE-COATED DAILY. CALCIUM CHLORIDES SHALL NOT BE UTILIZED, OTHER ADMIXTURES MAY BE USED ONLY WITH THE APPROVAL OF THE ENGINEER.

ALL CONCRETE MIX DESIGNS SHALL INCLUDE A WRITTEN DESCRIPTION INDICATING WHERE EACH PARTICULAR MIX IS TO BE PLACED WITHIN THE STRUCTURE.

ALL CONCRETE DESIGN MIX SUBMITTALS SHALL INCLUDE TESTED, STATISTICAL BACK-UP DATA AS PER CHAPTER 5 OF ACI 318-09.

**CONCRETE COVER OVER REINFORCING BARS:** THE FOLLOWING CONCRETE COVER OVER REINFORCING BARS SHALL BE PROVIDED UNLESS NOTED OTHERWISE ON THE DRAWINGS:

- CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO SOIL - 3"
- CONCRETE EXPOSED TO SOIL OR WEATHER - #6 BARS AND LARGER - 2" COVER #5 BARS AND SMALLER - 1 1/2" COVER
- CONCRETE NOT EXPOSED TO SOIL OR WEATHER: 1) SLABS, WALLS & JOISTS #11 BARS AND SMALLER - 3/4" 2) BEAMS & COLUMNS (TIES & STIRRUPS) - 1 1/2" D) FOR EXTERIOR FORMED SLAB SEE DRAWINGS AS ADDITIONAL COVER MAY BE REQUIRED.

**CONCRETE TESTING:** AN INDEPENDENT TESTING LABORATORY SHALL PERFORM THE FOLLOWING TESTS ON CAST IN PLACE CONCRETE:

- ASTM C143 - "STANDARD TEST METHOD FOR SLUMP OF PORTLAND CEMENT CONCRETE." MAXIMUM SLUMP SHALL BE 5 INCHES BEFORE A PLASTICIZER IS ADDED.
- ASTM C39 - "STANDARD TEST METHOD FOR COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMENS." A SEPARATE TEST SHALL BE CONDUCTED FOR EACH CLASS, FOR EVERY 50 CUBIC YARDS (OR FRACTION THEREOF), PLACED PER DAY. REQUIRED CYLINDER(S) QUANTITIES AND TEST AGE AS FOLLOWS: 1 AT 7 DAYS 2 AT 28 DAYS

ONE ADDITIONAL RESERVE CYLINDER TO BE TESTED UNDER THE DIRECTION OF THE ENGINEER, IF REQUIRED, IF 28 DAY STRENGTH IS ACHIEVED, THE ADDITIONAL CYLINDER(S) MAY BE DISCARDED.

**CHEMICAL ANCHORS:** SHALL BE AN EQUAL TWO-PART EPOXY POLYMER INJECTION SYSTEM, SUCH AS SIMPSON SET-XP "STRUCTURAL ANCHORING ADHESIVE" OR ENGINEER APPROVED SUBSTITUTION, INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. INSTALLERS SHALL BE TRAINED BY THE MANUFACTURER'S REPRESENTATIVE. BRUSH AND BLOW OUT ALL HOLES.

**DESIGN LOADS:**

WIND LOAD:

150 MPH ULTIMATE WIND SPEED

116 MPH ASD WIND SPEED

WIND EXPOSURE C

RISK CATEGORY II

2017 FLORIDA BUILDING CODE

**WALL PARTITION TYPE NOTES**

- PARTITION TYPES ARE TAGGED ON THE FLOOR PLANS.
- ALL STUDS AND FURRING CHANNELS ARE TO BE SPACED 16" O.C. UNLESS NOTED OTHERWISE. PARTITION TYPES DESCRIBE THE PRIMARY WALL MEMBER AND SHEATHING. REFER TO FINISH SCHEDULE FOR ALL PARTITION FINISH DESIGNATIONS.
- PROVIDE SLIP JOINT CONNECTIONS AT THE TOPS OF ALL PARTITIONS WHICH INTERSECT THE STRUCTURE ABOVE, CAPABLE OF ACCOMMODATING UPWARD AND DOWNWARD VERTICAL DISPLACEMENT OF PRIMARY STRUCTURE THROUGH POSITIVE MECHANICAL ATTACHMENT TO STUD WEB. PROVIDE FIRE SAFING AT ALL SLIP JOINT CONNECTIONS IN FIRE RATED PARTITIONS.
- IN PARTITIONS WHERE BATT INSULATION FOR SOUNDPROOFING IS INDICATED, SEAL CONSTRUCTION AT PERIMETERS, BEHIND CONTROL AND EXPANSION JOINTS, OPENINGS, AND PENETRATIONS WITH A CONTINUOUS BEAD OF ACOUSTICAL SEALANT, INCLUDING A BEAD AT BOTH FACES OF THE PARTITIONS.
- AT METAL STUD WALLS, BLOCKING IS REQUIRED AT ALL WALL MOUNTED ITEMS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING LOCATIONS:
  - WALL MOUNTED COUNTERS AND COUNTERTOP SUPPORTS
  - WALL MOUNTED ACCESSORIES AND EQUIPMENT
  - WALL MOUNTED DOORSTOPS
  - WALL MOUNTED DOOR HOLD OPEN DEVICES AND/OR CLOSURES
  - TOILET ROOM PARTITIONS AND ACCESSORIES
- WALL MOUNTED TV/ MONITORS AND BRACKETS

**DOOR SCHEDULE REMARKS**

- LOUVERED DOOR.
- PROVIDE DOOR CLOSER

**GENERAL DOOR NOTES:**

- ALL DOORS ARE 1-3/4" UNLESS NOTED OTHERWISE.
- ALL HM FRAMES ARE 5-3/4" DEEP UNLESS NOTED OTHERWISE.

**DOOR HARDWARE SCHEDULE**

- MATCH EXISTING HARDWARE. COORD WITH OWNER

**DOOR SCHEDULE**

DOOR NUMBER	INT/EXT	DOOR TYPE	WIDTH	HEIGHT	FINISH	FIRE RATING	HDWR	TYPE	FRAME MATERIAL	FINISH	REMARKS
100A	INT	A	3'-0"	7'-0"	PNT	-	01	F1	HM	PNT	2
101A	INT	A	3'-0"	7'-0"	PNT	-	01	F1	HM	PNT	2
102A	INT	B	3'-0"	7'-0"	PNT	-	01	F1	HM	PNT	1

**FINISH SCHEDULE**

ROOM NUMBER	ROOM NAME	FLOOR FINISH	BASE FINISH	WALL FINISH	CEILING FINISH	CEILING HEIGHT
100A	OFFICE	CPT-1	RB-1	GYP-PNT-1	ACT-1	8'-0"
101A	RESTROOM	CT-2	CB	CT-1 GYP-PNT-1	GYP-PNT-1	8'-0"

**FINISH SELECTION LEGEND:**

- ACT-1 2X2 ACOUSTIC CEILING TILE (HIGH NRC), TEGULAR EDGE, PRELUDE 1516 TRACK
- CB 4X4 TILE COVE BASE (SELECTION BY OWNER)
- EX EX FINISH TO REMAIN
- CT-1 4X4 GLAZED WALL TILE (SELECTION BY OWNER)
- CT-2 2" X 2" UNGLAZED MOSAIC FLOOR TILE (SELECTION BY OWNER)
- GYP GYPSUM WALL BOARD
- PNT PAINTED
- RB 1" JOHNSONITE RUBBER BASE TO MATCH EXISTING.
- CPT-1 NEW CARPET TO MATCH EXISTING (COORDINATE WITH OWNER)

**GENERAL FINISH NOTES:**

- DRYWALL FINISH TO BE LEVEL 4, SMOOTH, UNLESS NOTED OTHERWISE.
- ALL WALLS SCHEDULED TO RECEIVE TILE, PROVIDE CEMENT BOARD.
- REFER TO ELEVATIONS FOR EXACT FINISH LOCATIONS

**DOOR TYPES**

1/4" = 1'-0"

**FRAME TYPE**

1/4" = 1'-0"

**WALL PARTITION TYPE NOTES**

**TYPE 1:**

1A 1/2" CEMENT BACKER BOARD ON EX MTL STUD WALL, V.I.F. SCHEDULED TILE. HEIGHT TO GYP CLG.

**TYPE 2:**

2A 3-5/8" METAL STUDS (16" O.C.), 5/8" GYP BOTH SIDES, BATT INSULATION MATCH EX ADJACENT WALL HEIGHT OR OTHERWISE PROVIDE 6" ABOVE CEILING, BRACE TO STR.

2B 3-5/8" METAL STUDS (16" O.C.), 1/2" CEMENT BACKER BOARD BOTH SIDES, SCHEDULED TILE BOTH SIDES.

2C 3-5/8" METAL STUDS (16" O.C.), 1/2" CEMENT BACKER BOARD AND SCHEDULED TILE ON BATHROOM SIDE ONLY. OFFICE/ HALLWAY SIDE IS 5/8" GYP, BATT INSULATION.

**TYPE 3:**

3A 3-5/8" METAL STUDS (16" O.C.), 1/2" CEMENT BOARD, SCHEDULED WALL TILE ON (1) SIDE. WALL HEIGHT IS TO FINISHED GYP CEILING.

**PARTITION TYPES**

N.T.S

**WALL MOUNTED TV/ MONITORS AND BRACKETS**

**DOOR SCHEDULE**

PER SCHEDULE

PER SCHEDULE

PER SCHEDULE

**DOOR TYPES**

1/4" = 1'-0"

**FRAME TYPE**

1/4" = 1'-0"

**WALL PARTITION TYPE NOTES**

**TYPE 1:**

1A 1/2" CEMENT BACKER BOARD ON EX MTL STUD WALL, V.I.F. SCHEDULED TILE. HEIGHT TO GYP CLG.

**TYPE 2:**

2A 3-5/8" METAL STUDS (16" O.C.), 5/8" GYP BOTH SIDES, BATT INSULATION MATCH EX ADJACENT WALL HEIGHT OR OTHERWISE PROVIDE 6" ABOVE CEILING, BRACE TO STR.

2B 3-5/8" METAL STUDS (16" O.C.), 1/2" CEMENT BACKER BOARD BOTH SIDES, SCHEDULED TILE BOTH SIDES.

2C 3-5/8" METAL STUDS (16" O.C.), 1/2" CEMENT BACKER BOARD AND SCHEDULED TILE ON BATHROOM SIDE ONLY. OFFICE/ HALLWAY SIDE IS 5/8" GYP, BATT INSULATION.

**TYPE 3:**

3A 3-5/8" METAL STUDS (16" O.C.), 1/2" CEMENT BOARD, SCHEDULED WALL TILE ON (1) SIDE. WALL HEIGHT IS TO FINISHED GYP CEILING.

**PARTITION TYPES**

N.T.S

**WALL MOUNTED TV/ MONITORS AND BRACKETS**

**DOOR SCHEDULE**

PER SCHEDULE

PER SCHEDULE

PER SCHEDULE

**DOOR TYPES**

1/4" = 1'-0"

**FRAME TYPE**

1/4" = 1'-0"

**COUNTY OF HIGHLANDS STATE OF FLORIDA**

**SWEET SPARKMAN ARCHITECTS**

T 941.952.0084  
F 941.952.0201  
FL AA26000857

2168 MAIN STREET  
SARASOTA, FL 34237

TODD SWEET, AIA, LEED AP  
FL LIC. #1019332

**HIGHLANDS COUNTY BOARD OF COUNTY COMMISSIONERS**

**HEALTH DEPARTMENT- HVAC UPGRADE AND ADA RESTROOM SHOWER. PROJECT # 16065**

SEBRING, FLORIDA, 33870

**100% CONSTRUCTION DOCUMENTS**

09/18/18

ISSUED FOR:

REV DESCRIPTION DATE

GRAPHIC SCALE:

0" = 1"

SCALE: As indicated

PROJECT MANAGER: TMS

DRAWN BY: CKF

A/E OF RECORD: TMS

PROJECT NO: 18498

SHEET TITLE: ENLARGED FLOOR PLANS & DETAILS

SHEET No.: **A2.1**

©2018 SWEET SPARKMAN ARCHITECTS, INC.

























2.01 MANUFACTURERS

2.01 MANUFACTURERS
Basis of Design: Cummins Power Generation
Model: DDPA Frequency 60 Fuel Type: Diesel KW rating: 250 standby / 125 prime/minimum load. EPA NPS Stationary Emergency Tier 3 A. Subject to compliance with all other specified requirements, manufacturers offering products which may be incorporated in Work shall include:

2.02 GENERATOR SETS

- A. Except as otherwise indicated, provide manufacturer's standard diesel engine-driven generator set and auxiliary equipment as indicated by published product information, and as required for a complete installation. Generator set shall be rated to continuously power the total accumulated load and starting load shown on Schedule at 100 degrees Fahrenheit temperature and all altitude where installed.
B. Diesel Engine: Provide a 4-cycle, compression ignition type engine for operation on a commercial grade of petroleum fuel oil such as No. 2 fuel oil. Engine operating speed shall not exceed 1800 rpm and shall be controlled by a governor to maintain alternator frequency within plus or minus 0.5 percent of 60 hertz from no load to full load. Frequency shall recover to 60 Hz steady-state load within 15 seconds after operation of 90 percent rated load.
C. Starting System: Provide engine-generator unit with 12- or 24-volt, negative ground, starting system including emergency alternate starting-motor, batteries, and 30-amp, or greater, automatic battery charging alternator with auto-raise voltage regulator. Mount batteries in a plastic- or epoxy-coated metal platform near the starter but not on the generator and load battery terminals with an on-air-stand. Generator set rated 150 kW or less shall have a battery rated 4500 amp-hours cold cranking at 0 degree F and 1700 minutes reserve capacity by SAE Standard J227. Larger generator sets shall have a battery rated either 220 amp-hours or 900 amp-hours cold cranking, and 430 minutes reserve capacity. Batteries shall have a 12-month full warranty and 60-month prorated warranty.
D. Battery Charger: Provide a solid-state, current limiting, foot-type battery charger with 20 amp minimum output. Charge of full capacity Ni-Cd cells. Charger shall be designed to accept 120-volt AC single phase, 60 hertz power and shall automatically keep batteries at full charge. Equip charger with ammeter and voltmeter and self-diagnostics means. Boss of design: "NED 24" series intelligent 60Hz 3000 watt battery charger or approved equal by Lohmeyer.
E. Alternator: Steady-State Voltage Regulation Bandwidth: 3 percent of rated output voltage from no load to full load.
1. Transient Voltage Performance (Voltage Rise): Not more than 0.05 percent for 100 percent step-load increase or decrease of rated power factor. Voltage shall recover and remain within the steady-state operating band (within 0.5% of rated voltage) within five seconds.
2. Steady-State Frequency Regulation Bandwidth: 0.5 percent of rated frequency from no load to full load. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operating band and no hunting or hunting of speed. Transient Frequency Performance: Less than 5 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within five seconds.
3. Output Regulation at Low Load: Harmonic content measured line to neutral shall not exceed 5 percent total and 3 percent per single harmonic. Telephone influence factor, determined according to IEEE 519, shall not exceed 10 percent.
4. Output Regulation at Full Load: Harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent per single harmonic. Telephone influence factor, determined according to IEEE 519, shall not exceed 30 percent.
5. Sustained Short-Circuit Current: For a 3-phase, bolted short circuit of system output terminals, system shall supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically without damage to generator system components.
6. Start Time: Comply with NEMA 110 (Level 1) type II system requirements. Upon loss of power the generator shall start and assume emergency load within 10 seconds.
7. The generator set shall provide sufficient kVA (motor starting capability) in a single step to start all loads shown in the Contract Drawings connected to the emergency bus.
8. The generator set shall be capable of sustaining a minimum of 90% of no load voltage, with the specified load and power factor applied to the generator set. An oversized alternator shall be provided to handle the harmonics from VFD loads.
F. Engine Cooling Radiator: Provide a complete engine cooling system equipped with a radiator and blower fan sized to maintain safe operation, 180 degrees F engine outlet water temperature at 100 degrees F maximum ambient temperature. The engine cooling system shall be filled with a solution of 50 percent ethylene glycol. In motor mounted units, radiator shall be equipped with a duct exhaust flange. An air duct with flexible connecting sections shall be provided between radiator duct flange and generator.
G. Instrument Control Panel: Automatic Starting System Sequence of Operation: When mode-selector switch is returned to the on position, generator set starts. The off position of some switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down generator set. Basis of Design is Cummins Power Generation PowerCommand PCC 2.2 with Amp-Sentry protection or approved equal.
1. The generator set shall be provided with a microprocessor-based control system that is designed to provide automatic starting, monitoring, and control functions for the generator set. The control system shall also be designed to allow local monitoring and control of the generator set, and remote monitoring and control as described in this specification.
2. The control panel shall be mounted on the generator set. The control panel shall be vibration isolated and prototyped tested to verify the durability of all components in the system under the vibration conditions encountered.
3. The generator set shall be provided with alarm and status indicating lamps to indicate non-automatic generator status, and existing warning and shutdown conditions in a common control and monitoring panel mounted on the generator set. The lamps shall be high-intensity LED type. The lamp condition shall be clearly apparent under night room lighting conditions. The generator set control shall indicate the existence of alarm and shutdown conditions on an alphanumeric digital display panel.
4. Digital Indicating and Protective Devices and Controls: As required by NEMA 110 for Level 1 system, and the following:
a. AC voltmeter
b. AC ammeter
c. AC frequency meter
d. DC voltmeter (generator battery charging)
e. Engine-coolant temperature gage
f. Engine lubricating oil pressure gage
g. Running-time meter
h. Ammeter/voltmeter, phase-selector switch(es)
i. Generator-voltage adjusting control
j. Fuel tank high-level shutdown of fuel supply alarm
k. Generator overheat (alarm)
l. Oil pressure under filter (alarm)
m. Engine temperature sensor failure (alarm)
n. Fail to start (shutdown)
o. Fail to start/overrun (shutdown)
p. Weak battery (alarm)
q. Low fuel-oil tank (alarm)
r. High AC voltage (shutdown)
s. Low AC voltage (shutdown)
t. Under frequency (shutdown)
u. Over current (shutdown)
v. Over current (shutdown)
w. Short circuit (shutdown)
5. Supporting Items: include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Loose sensors and other supporting items on engine or generator, unless otherwise indicated.
6. Common Remote Audible Alarm Annunciator: include necessary contacts and terminals in control and monitoring panel. An LED labeled with proper alarm conditions shall identify each alarm event and a common audible signal shall sound for each alarm condition. "Silencing" switch in face of panel shall silence signal without starting visual indication. "Cancel" switch that after an alarm is silenced, clearing of inhibiting condition will reactivate alarm until silencing switch is reset. Cabinet and enclosure are surface- or flush-mounted with set to match mounting conditions indicated. Comply with NEMA 110 requirements for Level 1 systems and the following:
a. Overvoltage shutdown
b. Coolant low-temperature alarm
c. Control switch not in auto position
d. Battery-charger malfunction alarm
e. Battery low-voltage alarm
f. Battery high-voltage alarm
g. Loss of normal power to charger alarm
2.03 ENGINE-GENERATOR SET ACCESSORIES

- A. Enclosure: Generator set shall be provided with a six-light outdoor enclosure. Enclosure roof shall be constructed from a minimum of 0.90 MBR Grade Aluminum. Side panels shall be constructed from a minimum of .290 MBR Grade Aluminum. The Side Walls shall be complete with necessary access doors and ventilating louvers. There shall be at least 2 access door on each side of enclosure and one of the generator control panel access to the controls. Doors shall be hung on full-length piano hinges and shall be equipped with handles. Louvers shall be stationary type and shall be opened to provide adequate protection against rainfall of 15 degrees from vertical. All of intake louvers shall be sized so as to exceed 3 inches of water column while providing the required general cooling and combustion air flow. Enclosure shall be of bolted frame panel type construction. Enclosure shall be large enough to fully enclose all components necessary to the system including the alternator. All doors shall be key locked or capable of being locked via padlocks.
1. All rigid conduits within the housing shall be intermediate metallic conduit, galvanized steel, or rigid metallic conduit as permitted by NEC. Flexible metallic conduits shall be weatherproof (sealing) PVC over steel or aluminum core. All fittings shall be compression type. Use of EMT will not be permitted.
2. When this outdoor enclosure is specified, the temperature specifications for unit shall be 0 degrees F to 120 degrees F with ambient air at or below 100 degrees F maximum.
3. Louvers, plenums and all openings to be protected from rot and intrusion by means of grating.
B. Sound Attenuation: Enclosure shall be factory built with insulation sufficient enough to attenuate sound, and to include sound attenuating louvers, baffles and plenums that are designed to direct the unit's radiated exhaust air in a manner that minimizes ambient noise while the generator is running. Enclosure air assembly shall reduce noise to a maximum of 75 dBA weighted average when sampled at 75 meters from the generator (in Free Field Conditions) at 8 equal points, with operation.
C. Fuel Storage System: The generator manufacturer shall fabricate, provide and/or integrate a dual-wall above ground fuel storage tank in sub-base design that is UL142 or Florida Department of Environmental Protection compliant in a manner that the engine generator, housing and fuel tank arrive on the project site as an integrated and assembled unit.

- 1. The FDP - EQ Number - for the fuel tank as an assembly, showing compliance to Chapter 62-762. Note: Above Ground Storage Tank Systems including providing the EQ Numbers for all accessories. EQ compliance documentation shall be provided in the Submittals.
2. Tank capacity shall provide for 48 hours of runtime at 100% of the generator's nameplate load. The low-level fuel alarm shall be set to announce when fuel reaches the 12 hour remaining mark without triggering the fuel tank's low-level sensor.
3. Regulatory tank size information, the fuel tank shall be furnished with pre-arranged to allow prior to arrival at the project site.
4. The installing Contractor is responsible for providing all on-site testing that may be required under NFPA 30 prior to introducing fuel into the tank.
5. The Contractor shall be responsible for providing all pre-permitting in compliance to an applicable local and State jurisdiction.
6. The installing Contractor shall provide fuel for commissioning and field testing. The Owner shall provide a "top-off" after testing and commissioning is completed.
D. Coolant Header: Provide an engine coolant header, or voltage indicated on drawings or schedules, with thermocouples and connections to maintain engine coolant at 140 C or, to proper temperature to furnish start-up temperature.
E. Unit and Exhaust Systems: Silencers and exhaust piping to silencers shall be self-supporting when assembled and reinforced in such a manner that supporting systems are rigid or flexible where required by the engine generator manufacturer's recommendations. The generator manufacturer shall provide and install all necessary supporting members for ductwork between baffles and between the radiator and the relief bypass. The unit shall be complete with run stop. An exhaust duct shall be Schedule 10 steel pipe, minimum. All fittings and hardware shall be stainless steel.
1. Provide a silencer which meets sound standards of a critical area. Silencer shall provide attenuation (input to output) of 25 dB or greater at frequencies of 125 hertz to 8 kilohertz. A curve shall be submitted with Sound Drawings showing attenuation (input to output) in dB versus frequency. Curve shall be on manufacturer's standard data sheet or file on independent test lab. A split or bellows-type flexible section of pipe shall be installed in the exhaust line between the muffler and engine manifold connection.
2. The Contractor shall coordinate with the electrical trades on the electrical hookups as provided within the generator housing to provide for connection of all generator accessories including the block heater, attenuator heater, convenience outlets and enclosure lighting as indicated or as required by the construction documents.
F. Mainline Circuit Breaker: A generator-mounted thermal-magnetic, molded case circuit breaker shall be installed as a manual load circuit interrupter and one or two means of overload and short circuit protection device.
1. The circuit breaker shall use a solid-state trip plug type for all sizes rated 400 amp continuous and larger. The solid-state trip plug shall include Long-time, Short-time, and instantaneous settings.
2. Provide an auxiliary relay accessory and shut trip. Provide ground fault monitoring and trip as/it/required by NEC.
3. The Contractor shall adjust trip settings as determined by the Schedules and drawings and adjust as needed at an additional charge to the Owner, as determined by the Engineer.
PART 3 - EXECUTION
3.01 INSTALLATION OF DIESEL ENGINE-DRIVEN GENERATOR SETS
A. Provide and install a diesel engine-driven generator unit as indicated by construction documents. Comply with all the manufacturer's referenced UL, IEEE, NEC, NEMA and NEMA standards pertaining to installation of engine-generator sets and accessories.
B. Coordinate the site logistics and installation of access, electrical boxes and fittings, fuel tanks, piping, and accessories, as necessary to interface installation of engine generator equipment work with other work.
C. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque-tightening values for equipment connectors. Where manufacturer's torqueing requirements are not provided, tighten connectors and terminals to comply with tightening torque specified in UL Standards 484A and B, and the National Electrical Code.
D. Install the generator on its slab using ACE 101 or engineer-approved vibration isolation pads fastened to the full tank base in accordance with manufacturer's instructions.
E. Connect of hoses and piping to generator equipment as indicated on the drawings, and comply with manufacturer's installation instructions.
F. The Contractor shall install the engine generator in accordance to the manufacturer's published recommendations, which shall be provided in digital format at time of submittal, installing in a manner that will avoid substantial vibration which results in damage to the equipment, poor performance or equipment failure as determined by consensus of the Owner and Engineer, shall be remedied by the Contractor, at his expense.
G. The Contractor shall perform ANSI/NETA testing routines as required by the Construction Documents except for the injection test (performed if the diesel engine generator's alternator). The generator manufacturer shall provide a factory document showing the alternator windings were tested at plant level and conform to IEEE 43 standards. This documentation shall be provided with the project close-out documents.
3.02 DISASSEMBLY
A. Provide equipment grading connections for diesel engine-driven generator units as indicated on the construction documents and required by NEC. Tighten all connections to comply with tightening torque specified in UL Standards 484A to ensure permanent and effective grounds.
3.03 FIELD QUALITY CONTROL
A. Start-Up Testing
1. The Contractor shall retain the services of the generator manufacturer's local field technical staff to perform start-up and building load tests upon completion of installation, with ENGINEER and local AIA in attendance. Contractor to provide the Engineer and Owner with the field reports to include the following:
a. Check Run, Verifying log, one print/line in liquid-cooled modes for conformity to manufacturer's recommendations under environmental conditions present.
b. Test print for generator set, one print/line in liquid-cooled modes for conformity to manufacturer's recommendations under environmental conditions present.
c. Check, during start-up test mode, for exhaust leaks, cooling air flow, movement during starting and stopping, vibration during running, normal and emergency line-to-line voltages, and phase rotation.
d. Test, by means of simulated power outage, automatic start-up by remote-automatic starting, transfer of load, and automatic shutdown. Prior to this test, adjust for proper system coordination, transfer switch times. After installation inspection and the adjustments have been completed, the Generator set shall be connected to respective type load banks, matching the full rated output of the installed generator set.
1) Perform an NEMA 110 Level-1 test to include building and relative load bank loads. Testing is to be performed after installation in the presence of the Engineer, Owner, and any other local AIA. The manufacturer will provide one day of on-site commissioning and testing plus, one day of on-site Owner Training. Subsequent time required due to scheduling or logistics will be charged to the Contractor at the manufacturer's published rates.
2) Coordinate all elements of field commissioning and testing with Engineer, Owner, and any other required authority for appropriate test site and time.
3) During the Load Bank test, the generator technical staff electronically monitor the engine temperature, oil pressure, battery charge level, generator voltage, amperes, and frequency. Voltage will be observed with a recording device made built into the generator manufacturer's monitoring software. Voltage dip is defined as the peak-to-peak voltage minimum at starting compared to the average peak-to-peak voltage with the starting load running. The difference shall be less than 25 percent of the running P-V voltage. A recording print-out and electronic file of the test results shall be provided to the Engineer at the conclusion of these tests.
e. Upon completion of installation and testing, demonstrate capability and compliance of system with requirements. Reassemble and connect miscellaneous components at all components at site, then return to demonstration compliance. Should a miscellaneous component fail these elements to connect, the Owner retains the right to have the defective components removed and replaced with new units, and then proceed with retesting initial testing and retesting to be at no cost to OWNER.
3.04 PERSONNEL TRAINING
A. Building Operating Personnel Training: The manufacturer shall provide one-day of On-Site training in which the Owner's building personnel shall be obtained in procedure for starting-up, testing, and maintenance under normal conditions.
B. Additional training to be made available to the Owner's request and will be provided of the Manufacturer's published labor rates.
3.05 BASIS OF DESIGN ENGINE-GENERATOR DETAILS & PROPOSED SUBSTITUTIONS
1. This section is provided to detail the Basis of Design equipment. Equipment proposed for use or manufactured by companies not indicated as acceptable within this Specification shall only/or published weight, size or footprint is not demonstrated to be "equal" in the opinion of the Engineer. "Equal" is defined as being the same as or superior to, as determined by the Engineer's review.
2. Should a Substitute Proposal be submitted for review by the Owner and Engineer prior to bid, the Contractor is responsible for all costs related to use and installation of the Substitute proposal, including to-be or re-review of project documentation, on-site or re-engineering time for coordination of using the Substitute proposal, inclusive of meeting or office talking time for coordination with the project team.
3. When evaluation metrics are used to compare Substitute and the Basis of Design product, the manufacturer or other party seeking approval of a Substitute shall provide the Owner and Engineer with supplemental information on the manufacturer's letterhead, sealed by a representative of the Manufacturer, showing calculations and derivations used to demonstrate the performance of the Substitute product as equal-to or superior-to the on-as-specified product. Failure to provide this information on the manufacturer's letterhead will be grounds for rejection.
4. Drawings provided to document equality in terms of dimensions or other footprint metrics shall be sealed and sealed by a registered P.E.
5. The Contractor shall bear all costs for preparation, delivery and review of requests for substitutions including costs of the Engineer and/or Owner to review the same.
6. A formal request for SUBSTITUTION shall be delivered to the Engineer by means of the governing (Purchasing) authority of at least 10 business days prior to the advertised Bid Date. These requests shall include appropriate engineering drawings and catalog materials, International literature and specifications equal to that of the Basis of Design equipment.
7. The Contractor assumes all responsibility for providing equipment that fails to meet the Basis of Design performance standards.

- 1. NFPA Compliance: Comply with applicable requirements of NFPA 37, "Installation and Use of Stationary Combustion Engines and Gas Turbines," NFPA 99, "Standard for Health Care Facilities," and NFPA 101, "Code for Safety to Life from Fire in Buildings and Structures."
2. UL Compliance: UL 888A, "Wire Connectors and Supporting Lugs for Use with Copper Conductors," UL 2200, "Standard for Safety for Stationary Engine Generator Assemblies," rated 600 volts or less.
3. ANSI/NEMA Compliance: Comply with applicable requirements of ANSI/NEMA MG-1, "Motors and Generators," and NEC, "Safety and Use of Electric Motors and Generators."
4. IEEE Compliance: Comply with applicable portions of IEEE Standard 446, "IEEE Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications."
5. Generator mounted fuel tanks shall comply and bear UL142 label. Fuel tanks exceeding 500 gallons shall comply with FDEP, C/A, listing will not be accepted as compliance to UL142.
6. Other compliances under UL may also be required. See submittals and drawings for details.
B. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in material or workmanship within specified warranty period. List any exception to covered components within the Submittal. Warranty shall be "comprehensive" in nature to include parts, labor and travel.
1. Warranty Period: Within five years from date of Substantial Completion.
2. Labor and travel time for necessary repairs at the job site shall be included.
3. When running hours are a limiting factor for system warranty, include a detailed copy of the Warranty limitations.
C. One Source or Supply: The diesel engine generator's alternator, engine and related controls shall be manufactured by the same company and assembled into an operational diesel engine generator by the same company in an ISO 9001 certified plant facility. No exceptions.
D. The supplying generator Vendor shall be a duly appointed or factory owned and operated Distributor of the engine and generator manufacturer, so as to provide the Owner with one source of supply for sales, parts and service - before and post-warranty.
E. For the purposes of this specification, a selling "dealer" will not be considered as a manufacturer's authorized or operated Distributor.

1.03 QUALITY ASSURANCE

- A. Codes and Standards:
1. NFPA Compliance: Comply with applicable requirements of NFPA 37, "Installation and Use of Stationary Combustion Engines and Gas Turbines," NFPA 99, "Standard for Health Care Facilities," and NFPA 101, "Code for Safety to Life from Fire in Buildings and Structures."
2. UL Compliance: UL 888A, "Wire Connectors and Supporting Lugs for Use with Copper Conductors," UL 2200, "Standard for Safety for Stationary Engine Generator Assemblies," rated 600 volts or less.
3. ANSI/NEMA Compliance: Comply with applicable requirements of ANSI/NEMA MG-1, "Motors and Generators," and NEC, "Safety and Use of Electric Motors and Generators."
4. IEEE Compliance: Comply with applicable portions of IEEE Standard 446, "IEEE Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications."
5. Generator mounted fuel tanks shall comply and bear UL142 label. Fuel tanks exceeding 500 gallons shall comply with FDEP, C/A, listing will not be accepted as compliance to UL142.
6. Other compliances under UL may also be required. See submittals and drawings for details.
B. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in material or workmanship within specified warranty period. List any exception to covered components within the Submittal. Warranty shall be "comprehensive" in nature to include parts, labor and travel.
1. Warranty Period: Within five years from date of Substantial Completion.
2. Labor and travel time for necessary repairs at the job site shall be included.
3. When running hours are a limiting factor for system warranty, include a detailed copy of the Warranty limitations.
C. One Source or Supply: The diesel engine generator's alternator, engine and related controls shall be manufactured by the same company and assembled into an operational diesel engine generator by the same company in an ISO 9001 certified plant facility. No exceptions.
D. The supplying generator Vendor shall be a duly appointed or factory owned and operated Distributor of the engine and generator manufacturer, so as to provide the Owner with one source of supply for sales, parts and service - before and post-warranty.
E. For the purposes of this specification, a selling "dealer" will not be considered as a manufacturer's authorized or operated Distributor.

2.01 MANUFACTURERS
Basis of Design: Cummins Power Generation
Model: DDPA Frequency 60 Fuel Type: Diesel KW rating: 250 standby / 125 prime/minimum load. EPA NPS Stationary Emergency Tier 3 A. Subject to compliance with all other specified requirements, manufacturers offering products which may be incorporated in Work shall include:

- A. Except as otherwise indicated, provide manufacturer's standard diesel engine-driven generator set and auxiliary equipment as indicated by published product information, and as required for a complete installation. Generator set shall be rated to continuously power the total accumulated load and starting load shown on Schedule at 100 degrees Fahrenheit temperature and all altitude where installed.
B. Diesel Engine: Provide a 4-cycle, compression ignition type engine for operation on a commercial grade of petroleum fuel oil such as No. 2 fuel oil. Engine operating speed shall not exceed 1800 rpm and shall be controlled by a governor to maintain alternator frequency within plus or minus 0.5 percent of 60 hertz from no load to full load. Frequency shall recover to 60 Hz steady-state load within 15 seconds after operation of 90 percent rated load.
C. Starting System: Provide engine-generator unit with 12- or 24-volt, negative ground, starting system including emergency alternate starting-motor, batteries, and 30-amp, or greater, automatic battery charging alternator with auto-raise voltage regulator. Mount batteries in a plastic- or epoxy-coated metal platform near the starter but not on the generator and load battery terminals with an on-air-stand. Generator set rated 150 kW or less shall have a battery rated 4500 amp-hours cold cranking at 0 degree F and 1700 minutes reserve capacity by SAE Standard J227. Larger generator sets shall have a battery rated either 220 amp-hours or 900 amp-hours cold cranking, and 430 minutes reserve capacity. Batteries shall have a 12-month full warranty and 60-month prorated warranty.
D. Battery Charger: Provide a solid-state, current limiting, foot-type battery charger with 20 amp minimum output. Charge of full capacity Ni-Cd cells. Charger shall be designed to accept 120-volt AC single phase, 60 hertz power and shall automatically keep batteries at full charge. Equip charger with ammeter and voltmeter and self-diagnostics means. Boss of design: "NED 24" series intelligent 60Hz 3000 watt battery charger or approved equal by Lohmeyer.
E. Alternator: Steady-State Voltage Regulation Bandwidth: 3 percent of rated output voltage from no load to full load.
1. Transient Voltage Performance (Voltage Rise): Not more than 0.05 percent for 100 percent step-load increase or decrease of rated power factor. Voltage shall recover and remain within the steady-state operating band (within 0.5% of rated voltage) within five seconds.
2. Steady-State Frequency Regulation Bandwidth: 0.5 percent of rated frequency from no load to full load. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operating band and no hunting or hunting of speed. Transient Frequency Performance: Less than 5 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within five seconds.
3. Output Regulation at Low Load: Harmonic content measured line to neutral shall not exceed 5 percent total and 3 percent per single harmonic. Telephone influence factor, determined according to IEEE 519, shall not exceed 10 percent.
4. Output Regulation at Full Load: Harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent per single harmonic. Telephone influence factor, determined according to IEEE 519, shall not exceed 30 percent.
5. Sustained Short-Circuit Current: For a 3-phase, bolted short circuit of system output terminals, system shall supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically without damage to generator system components.
6. Start Time: Comply with NEMA 110 (Level 1) type II system requirements. Upon loss of power the generator shall start and assume emergency load within 10 seconds.
7. The generator set shall provide sufficient kVA (motor starting capability) in a single step to start all loads shown in the Contract Drawings connected to the emergency bus.
8. The generator set shall be capable of sustaining a minimum of 90% of no load voltage, with the specified load and power factor applied to the generator set. An oversized alternator shall be provided to handle the harmonics from VFD loads.
F. Engine Cooling Radiator: Provide a complete engine cooling system equipped with a radiator and blower fan sized to maintain safe operation, 180 degrees F engine outlet water temperature at 100 degrees F maximum ambient temperature. The engine cooling system shall be filled with a solution of 50 percent ethylene glycol. In motor mounted units, radiator shall be equipped with a duct exhaust flange. An air duct with flexible connecting sections shall be provided between radiator duct flange and generator.
G. Instrument Control Panel: Automatic Starting System Sequence of Operation: When mode-selector switch is returned to the on position, generator set starts. The off position of some switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down generator set. Basis of Design is Cummins Power Generation PowerCommand PCC 2.2 with Amp-Sentry protection or approved equal.
1. The generator set shall be provided with a microprocessor-based control system that is designed to provide automatic starting, monitoring, and control functions for the generator set. The control system shall also be designed to allow local monitoring and control of the generator set, and remote monitoring and control as described in this specification.
2. The control panel shall be mounted on the generator set. The control panel shall be vibration isolated and prototyped tested to verify the durability of all components in the system under the vibration conditions encountered.
3. The generator set shall be provided with alarm and status indicating lamps to indicate non-automatic generator status, and existing warning and shutdown conditions in a common control and monitoring panel mounted on the generator set. The lamps shall be high-intensity LED type. The lamp condition shall be clearly apparent under night room lighting conditions. The generator set control shall indicate the existence of alarm and shutdown conditions on an alphanumeric digital display panel.
4. Digital Indicating and Protective Devices and Controls: As required by NEMA 110 for Level 1 system, and the following:
a. AC voltmeter
b. AC ammeter
c. AC frequency meter
d. DC voltmeter (generator battery charging)
e. Engine-coolant temperature gage
f. Engine lubricating oil pressure gage
g. Running-time meter
h. Ammeter/voltmeter, phase-selector switch(es)
i. Generator-voltage adjusting control
j. Fuel tank high-level shutdown of fuel supply alarm
k. Generator overheat (alarm)
l. Oil pressure under filter (alarm)
m. Engine temperature sensor failure (alarm)
n. Fail to start (shutdown)
o. Fail to start/overrun (shutdown)
p. Weak battery (alarm)
q. Low fuel-oil tank (alarm)
r. High AC voltage (shutdown)
s. Low AC voltage (shutdown)
t. Under frequency (shutdown)
u. Over current (shutdown)
v. Over current (shutdown)
w. Short circuit (shutdown)
5. Supporting Items: include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Loose sensors and other supporting items on engine or generator, unless otherwise indicated.
6. Common Remote Audible Alarm Annunciator: include necessary contacts and terminals in control and monitoring panel. An LED labeled with proper alarm conditions shall identify each alarm event and a common audible signal shall sound for each alarm condition. "Silencing" switch in face of panel shall silence signal without starting visual indication. "Cancel" switch that after an alarm is silenced, clearing of inhibiting condition will reactivate alarm until silencing switch is reset. Cabinet and enclosure are surface- or flush-mounted with set to match mounting conditions indicated. Comply with NEMA 110 requirements for Level 1 systems and the following:
a. Overvoltage shutdown
b. Coolant low-temperature alarm
c. Control switch not in auto position
d. Battery-charger malfunction alarm
e. Battery low-voltage alarm
f. Battery high-voltage alarm
g. Loss of normal power to charger alarm
2.03 ENGINE-GENERATOR SET ACCESSORIES

- A. Enclosure: Generator set shall be provided with a six-light outdoor enclosure. Enclosure roof shall be constructed from a minimum of 0.90 MBR Grade Aluminum. Side panels shall be constructed from a minimum of .290 MBR Grade Aluminum. The Side Walls shall be complete with necessary access doors and ventilating louvers. There shall be at least 2 access door on each side of enclosure and one of the generator control panel access to the controls. Doors shall be hung on full-length piano hinges and shall be equipped with handles. Louvers shall be stationary type and shall be opened to provide adequate protection against rainfall of 15 degrees from vertical. All of intake louvers shall be sized so as to exceed 3 inches of water column while providing the required general cooling and combustion air flow. Enclosure shall be of bolted frame panel type construction. Enclosure shall be large enough to fully enclose all components necessary to the system including the alternator. All doors shall be key locked or capable of being locked via padlocks.
1. All rigid conduits within the housing shall be intermediate metallic conduit, galvanized steel, or rigid metallic conduit as permitted by NEC. Flexible metallic conduits shall be weatherproof (sealing) PVC over steel or aluminum core. All fittings shall be compression type. Use of EMT will not be permitted.
2. When this outdoor enclosure is specified, the temperature specifications for unit shall be 0 degrees F to 120 degrees F with ambient air at or below 100 degrees F maximum.
3. Louvers, plenums and all openings to be protected from rot and intrusion by means of grating.
B. Sound Attenuation: Enclosure shall be factory built with insulation sufficient enough to attenuate sound, and to include sound attenuating louvers, baffles and plenums that are designed to direct the unit's radiated exhaust air in a manner that minimizes ambient noise while the generator is running. Enclosure air assembly shall reduce noise to a maximum of 75 dBA weighted average when sampled at 75 meters from the generator (in Free Field Conditions) at 8 equal points, with operation.
C. Fuel Storage System: The generator manufacturer shall fabricate, provide and/or integrate a dual-wall above ground fuel storage tank in sub-base design that is UL142 or Florida Department of Environmental Protection compliant in a manner that the engine generator, housing and fuel tank arrive on the project site as an integrated and assembled unit.

- 1. The FDP - EQ Number - for the fuel tank as an assembly, showing compliance to Chapter 62-762. Note: Above Ground Storage Tank Systems including providing the EQ Numbers for all accessories. EQ compliance documentation shall be provided in the Submittals.
2. Tank capacity shall provide for 48 hours of runtime at 100% of the generator's nameplate load. The low-level fuel alarm shall be set to announce when fuel reaches the 12 hour remaining mark without triggering the fuel tank's low-level sensor.
3. Regulatory tank size information, the fuel tank shall be furnished with pre-arranged to allow prior to arrival at the project site.
4. The installing Contractor is responsible for providing all on-site testing that may be required under NFPA 30 prior to introducing fuel into the tank.
5. The Contractor shall be responsible for providing all pre-permitting in compliance to an applicable local and State jurisdiction.
6. The installing Contractor shall provide fuel for commissioning and field testing. The Owner shall provide a "top-off" after testing and commissioning is completed.
D. Coolant Header: Provide an engine coolant header, or voltage indicated on drawings or schedules, with thermocouples and connections to maintain engine coolant at 140 C or, to proper temperature to furnish start-up temperature.
E. Unit and Exhaust Systems: Silencers and exhaust piping to silencers shall be self-supporting when assembled and reinforced in such a manner that supporting systems are rigid or flexible where required by the engine generator manufacturer's recommendations. The generator manufacturer shall provide and install all necessary supporting members for ductwork between baffles and between the radiator and the relief bypass. The unit shall be complete with run stop. An exhaust duct shall be Schedule 10 steel pipe, minimum. All fittings and hardware shall be stainless steel.
1. Provide a silencer which meets sound standards of a critical area. Silencer shall provide attenuation (input to output) of 25 dB or greater at frequencies of 125 hertz to 8 kilohertz. A curve shall be submitted with Sound Drawings showing attenuation (input to output) in dB versus frequency. Curve shall be on manufacturer's standard data sheet or file on independent test lab. A split or bellows-type flexible section of pipe shall be installed in the exhaust line between the muffler and engine manifold connection.
2. The Contractor shall coordinate with the electrical trades on the electrical hookups as provided within the generator housing to provide for connection of all generator accessories including the block heater, attenuator heater, convenience outlets and enclosure lighting as indicated or as required by the construction documents.
F. Mainline Circuit Breaker: A generator-mounted thermal-magnetic, molded case circuit breaker shall be installed as a manual load circuit interrupter and one or two means of overload and short circuit protection device.
1. The circuit breaker shall use a solid-state trip plug type for all sizes rated 400 amp continuous and larger. The solid-state trip plug shall include Long-time, Short-time, and instantaneous settings.
2. Provide an auxiliary relay accessory and shut trip. Provide ground fault monitoring and trip as/it/required by NEC.
3. The Contractor shall adjust trip settings as determined by the Schedules and drawings and adjust as needed at an additional charge to the Owner, as determined by the Engineer.
PART 3 - EXECUTION
3.01 INSTALLATION OF DIESEL ENGINE-DRIVEN GENERATOR SETS
A. Provide and install a diesel engine-driven generator unit as indicated by construction documents. Comply with all the manufacturer's referenced UL, IEEE, NEC, NEMA and NEMA standards pertaining to installation of engine-generator sets and accessories.
B. Coordinate the site logistics and installation of access, electrical boxes and fittings, fuel tanks, piping, and accessories, as necessary to interface installation of engine generator equipment work with other work.
C. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque-tightening values for equipment connectors. Where manufacturer's torqueing requirements are not provided, tighten connectors and terminals to comply with tightening torque specified in UL Standards 484A and B, and the National Electrical Code.
D. Install the generator on its slab using ACE 101 or engineer-approved vibration isolation pads fastened to the full tank base in accordance with manufacturer's instructions.
E. Connect of hoses and piping to generator equipment as indicated on the drawings, and comply with manufacturer's installation instructions.
F. The Contractor shall install the engine generator in accordance to the manufacturer's published recommendations, which shall be provided in digital format at time of submittal, installing in a manner that will avoid substantial vibration which results in damage to the equipment, poor performance or equipment failure as determined by consensus of the Owner and Engineer, shall be remedied by the Contractor, at his expense.
G. The Contractor shall perform ANSI/NETA testing routines as required by the Construction Documents except for the injection test (performed if the diesel engine generator's alternator). The generator manufacturer shall provide a factory document showing the alternator windings were tested at plant level and conform to IEEE 43 standards. This documentation shall be provided with the project close-out documents.
3.02 DISASSEMBLY
A. Provide equipment grading connections for diesel engine-driven generator units as indicated on the construction documents and required by NEC. Tighten all connections to comply with tightening torque specified in UL Standards 484A to ensure permanent and effective grounds.
3.03 FIELD QUALITY CONTROL
A. Start-Up Testing
1. The Contractor shall retain the services of the generator manufacturer's local field technical staff to perform start-up and building load tests upon completion of installation, with ENGINEER and local AIA in attendance. Contractor to provide the Engineer and Owner with the field reports to include the following:
a. Check Run, Verifying log, one print/line in liquid-cooled modes for conformity to manufacturer's recommendations under environmental conditions present.
b. Test print for generator set, one print/line in liquid-cooled modes for conformity to manufacturer's recommendations under environmental conditions present.
c. Check, during start-up test mode, for exhaust leaks, cooling air flow, movement during starting and stopping, vibration during running, normal and emergency line-to-line voltages, and phase rotation.
d. Test, by means of simulated power outage, automatic start-up by remote-automatic starting, transfer of load, and automatic shutdown. Prior to this test, adjust for proper system coordination, transfer switch times. After installation inspection and the adjustments have been completed, the Generator set shall be connected to respective type load banks, matching the full rated output of the installed generator set.
1) Perform an NEMA 110 Level-1 test to include building and relative load bank loads. Testing is to be performed after installation in the presence of the Engineer, Owner, and any other local AIA. The manufacturer will provide one day of on-site commissioning and testing plus, one day of on-site Owner Training. Subsequent time required due to scheduling or logistics will be charged to the Contractor at the manufacturer's published rates.
2) Coordinate all elements of field commissioning and testing with Engineer, Owner, and any other required authority for appropriate test site and time.
3) During the Load Bank test, the generator technical staff electronically monitor the engine temperature, oil pressure, battery charge level, generator voltage, amperes, and frequency. Voltage will be observed with a recording device made built into the generator manufacturer's monitoring software. Voltage dip is defined as the peak-to-peak voltage minimum at starting compared to the average peak-to-peak voltage with the starting load running. The difference shall be less than 25 percent of the running P-V voltage. A recording print-out and electronic file of the test results shall be provided to the Engineer at the conclusion of these tests.
e. Upon completion of installation and testing, demonstrate capability and compliance of system with requirements. Reassemble and connect miscellaneous components at all components at site, then return to demonstration compliance. Should a miscellaneous component fail these elements to connect, the Owner retains the right to have the defective components removed and replaced with new units, and then proceed with retesting initial testing and retesting to be at no cost to OWNER.
3.04 PERSONNEL TRAINING
A. Building Operating Personnel Training: The manufacturer shall provide one-day of On-Site training in which the Owner's building personnel shall be obtained in procedure for starting-up, testing, and maintenance under normal conditions.
B. Additional training to be made available to the Owner's request and will be provided of the Manufacturer's published labor rates.
3.05 BASIS OF DESIGN ENGINE-GENERATOR DETAILS & PROPOSED SUBSTITUTIONS
1. This section is provided to detail the Basis of Design equipment. Equipment proposed for use or manufactured by companies not indicated as acceptable within this Specification shall only/or published weight, size or footprint is not demonstrated to be "equal" in the opinion of the Engineer. "Equal" is defined as being the same as or superior to, as determined by the Engineer's review.
2. Should a Substitute Proposal be submitted for review by the Owner and Engineer prior to bid, the Contractor is responsible for all costs related to use and installation of the Substitute proposal, including to-be or re-review of project documentation, on-site or re-engineering time for coordination of using the Substitute proposal, inclusive of meeting or office talking time for coordination with the project team.
3. When evaluation metrics are used to compare Substitute and the Basis of Design product, the manufacturer or other party seeking approval of a Substitute shall provide the Owner and Engineer with supplemental information on the manufacturer's letterhead, sealed by a representative of the Manufacturer, showing calculations and derivations used to demonstrate the performance of the Substitute product as equal-to or superior-to the on-as-specified product. Failure to provide this information on the manufacturer's letterhead will be grounds for rejection.
4. Drawings provided to document equality in terms of dimensions or other footprint metrics shall be sealed and sealed by a registered P.E.
5. The Contractor shall bear all costs for preparation, delivery and review of requests for substitutions including costs of the Engineer and/or Owner to review the same.
6. A formal request for SUBSTITUTION shall be delivered to the Engineer by means of the governing (Purchasing) authority of at least 10 business days prior to the advertised Bid Date. These requests shall include appropriate engineering drawings and catalog materials, International literature and specifications equal to that of the Basis of Design equipment.
7. The Contractor assumes all responsibility for providing equipment that fails to meet the Basis of Design performance standards.

- 1. NFPA Compliance: Comply with applicable requirements of NFPA 37, "Installation and Use of Stationary Combustion Engines and Gas Turbines," NFPA 99, "Standard for Health Care Facilities," and NFPA 101, "Code for Safety to Life from Fire in Buildings and Structures."
2. UL Compliance: UL 888A, "Wire Connectors and Supporting Lugs for Use with Copper Conductors," UL 2200, "Standard for Safety for Stationary Engine Generator Assemblies," rated 600 volts or less.
3. ANSI/NEMA Compliance: Comply with applicable requirements of ANSI/NEMA MG-1, "Motors and Generators," and NEC, "Safety and Use of Electric Motors and Generators."
4. IEEE Compliance: Comply with applicable portions of IEEE Standard 446, "IEEE Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications."
5. Generator mounted fuel tanks shall comply and bear UL142 label. Fuel tanks exceeding 500 gallons shall comply with FDEP, C/A, listing will not be accepted as compliance to UL142.
6. Other compliances under UL may also be required. See submittals and drawings for details.
B. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in material or workmanship within specified warranty period. List any exception to covered components within the Submittal. Warranty shall be "comprehensive" in nature to include parts, labor and travel.
1. Warranty Period: Within five years from date of Substantial Completion.
2. Labor and travel time for necessary repairs at the job site shall be included.
3. When running hours are a limiting factor for system warranty, include a detailed copy of the Warranty limitations.
C. One Source or Supply: The diesel engine generator's alternator, engine and related controls shall be manufactured by the same company and assembled into an operational diesel engine generator by the same company in an ISO 9001 certified plant facility. No exceptions.
D. The supplying generator Vendor shall be a duly appointed or factory owned and operated Distributor of the engine and generator manufacturer, so as to provide the Owner with one source of supply for sales, parts and service - before and post-warranty.
E. For the purposes of this specification, a selling "dealer" will not be considered as a manufacturer's authorized or operated Distributor.

- 1. NFPA Compliance: Comply with applicable requirements of NFPA 37, "Installation and Use of Stationary Combustion Engines and Gas Turbines," NFPA 99, "Standard for Health Care Facilities," and NFPA 101, "Code for Safety to Life from Fire in Buildings and Structures."
2. UL Compliance: UL 888A, "Wire Connectors and Supporting Lugs for Use with Copper Conductors," UL 2200, "Standard for Safety for Stationary Engine Generator Assemblies," rated 600 volts or less.
3. ANSI/NEMA Compliance: Comply with applicable requirements of ANSI/NEMA MG-1, "Motors and Generators," and NEC, "Safety and Use of Electric Motors and Generators."
4. IEEE Compliance: Comply with applicable portions of IEEE Standard 446, "IEEE Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications."
5. Generator mounted fuel tanks shall comply and bear UL142 label. Fuel tanks exceeding 500 gallons shall comply with FDEP, C/A, listing will not be accepted as compliance to UL142.
6. Other compliances under UL may also be required. See submittals and drawings for details.
B. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in material or workmanship within specified warranty period. List any exception to covered components within the Submittal. Warranty shall be "comprehensive" in nature to include parts, labor and travel.
1. Warranty Period: Within five years from date of Substantial Completion.
2. Labor and travel time for necessary repairs at the job site shall be included.
3. When running hours are a limiting factor for system warranty, include a detailed copy of the Warranty limitations.
C. One Source or Supply: The diesel engine generator's alternator, engine and related controls shall be manufactured by the same company and assembled into an operational diesel engine generator by the same company in an ISO 9001 certified plant facility. No exceptions.
D. The supplying generator Vendor shall be a duly appointed or factory owned and operated Distributor of the engine and generator manufacturer, so as to provide the Owner with one source of supply for sales, parts and service - before and post-warranty.
E. For the purposes of this specification, a selling "dealer" will not be considered as a manufacturer's authorized or operated Distributor.

2.01 MANUFACTURERS
Basis of Design: Cummins Power Generation
Model: DDPA Frequency 60 Fuel Type: Diesel KW rating: 250 standby / 125 prime/minimum load. EPA NPS Stationary Emergency Tier 3 A. Subject to compliance with all other specified requirements, manufacturers offering products which may be incorporated in Work shall include:

- A. Except as otherwise indicated, provide manufacturer's standard diesel engine-driven generator set and auxiliary equipment as indicated by published product information, and as required for a complete installation. Generator set shall be rated to continuously power the total accumulated load and starting load shown on Schedule at 100 degrees Fahrenheit temperature and all altitude where installed

AUTOMATIC TRANSFER SWITCH

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and related specification sections, including that of the diesel generator apply to this Section.

1.2 SUMMARY

A. This specification outlines the design and performance standards for the Contractor, who shall provide and install all Automatic Transfer Switch(es) in the site, compare & voltage rating and type as indicated on the construction documents, in accordance to all specifications herein.

B. This Section of the specification includes transfer switches rated 600 V and less, including the following:

- 1. Automatic transfer switches for emergency standby, manual or service entrance applications
2. Remote annunciation systems
3. Remote annunciation and control systems

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, weights, operating characteristics, furnished specialties, and accessories.

1. Technical data on all major components of all transfer switches and other products described in this section. Data is required for the transfer switch mechanism, control system, cabinet, and protective devices specifically listed for use with each transfer switch. Include steady state and fault current ratings, weights, operating characteristics, and furnished specialties and accessories.

2. Single-Line Diagram: Show connections between transfer switch, bypass/isolation switch, power sources, and load, and show interlocking provisions for each combined transfer switch and bypass/isolation switch.

B. Shop Drawings: Dimensioned plans, elevations, sections, and details showing minimum clearances, conductor entry provisions, guller spaces, installed features and devices, and material lists for each switch specified.

1. Dimensioned outline drawings of assembly, including elevations, sections, and details including minimal clearances, conductor entry provisions, guller space, installed features and devices and material lists for each switch specified.

2. Internal electrical wiring and control drawings.

3. Interconnection wiring diagrams, showing recommended conduit runs and point-to-point terminal connections to generator set.

4. Installation and mounting instructions, including information for proper installation of equipment to meet seismic requirements.

C. Manufacturer and Supplier Qualification Data

1. The transfer switch manufacturer shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development, production, installation, and service, in accordance with ISO 9001.

2. The manufacturer of this equipment shall have produced similar equipment for a minimum period of 10 years. When requested, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

D. Operation and Maintenance Data: For each type of product to include in emergency, operation, and maintenance manuals. In addition to items specified in Section "Operation and Maintenance Data," include the following:

1. Procedures and operating sequences, both automatic and manual.

2. List of all factory settings of relays, timers and protective devices; provide setting and calibration instructions where applicable.

E. Warranty documents demonstrating compliance with the project's contract requirements.

1.4 QUALITY ASSURANCE

A. Only vendors, suppliers & manufacturers approved or qualified by the Engineer acting as the Owner's representative shall supply equipment provided under this contract.

B. Manufacturer Qualifications: The equipment supplier shall maintain a service center capable of providing training, parts, maintenance and emergency repairs to equipment, including transfer switch generator sets and remote monitoring equipment (if applicable) at the site within a response period of less than 4 hours from time of notification.

1. Transfer switch(es) shall be commissioned by technicians directly employed, trained and factory certified on both, the servicing of the diesel engine generator and automatic transfer switches provided, and maintain an inventory of critical replacement parts at a local service organization. The transfer switch provider shall also operate a technical support call center and field service organizations in operation 24 hours per day, 365 days per year.

2. Submit names, experience level, training certifications, contact information and locations for a minimum of two local technicians that will be responsible for servicing equipment at this site.

3. The manufacturer shall maintain model and serial number records of each transfer switch provided for at least 20 years.

C. Source Limitations: All transfer switches are to be obtained through the same source of supply as the diesel engine generator, in a manner that a single manufacturer acts as the sole source of responsibility for sales, service, parts, preventive maintenance and warranty repair on all products provided.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked as suitable for use in emergency, legally required or optional standby use as appropriate for the connected load.

E. The automatic transfer switch installation and application shall conform to the requirements of the following codes and standards:

1. Transfer switches and enclosures shall be UL 1008 listed and labeled as suitable for use in emergency, legally required, and optional standby applications.

2. CSA 282, Emergency Electrical Power Supply for Buildings, and CSA C22.2, No. 14-M91 Industrial Control Equipment

3. NFPA 70, National Electrical Code. Equipment shall be suitable for use in systems in compliance with Articles 700, 701 and 702.

4. Comply with NEMA ICS 10-1993 AC Automatic Transfer Switches

5. IEC 2006 - The transfer switch(es) shall be prototype-tested and third-party certified to comply with the requirements of IEC group II or IV, Category D/F. The equipment shall be shipped with the installation instructions necessary to attain installation compliance.

6. IEEE 446 - Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications

7. EN50311, Class B Radiated Emissions and Class B Conducted Emissions

8. IEC 1000-4-5 (EN 61000-4-5) AC Surge Immunity

9. IEC 1000-4-4 (EN 61000-4-4) Fast Transients Immunity

10. IEC 1000-4-2 (EN 61000-4-2) Electrostatic Discharge Immunity

11. IEC 1000-4-3 (EN 61000-4-3) Radiated Field Immunity

12. IEC 1000-4-6 Conducted Field Immunity

13. IEC 1000-4-11 Voltage Dip Immunity

14. IEEE 62.41, AC Voltage Surge Immunity

15. IEEE 62.45, AC Voltage Surge Testing

F. Comply with NFPA 110 - Emergency and Standby Power Systems. The transfer switch shall meet all requirements for Level 1 systems, regardless of the actual critical load.

G. The manufacturer shall warrant the material and workmanship of the transfer switch equipment for a minimum of five (5) years from registered commissioning and start-up, or eighteen (18) months from date of shipment. The transfer mechanism itself shall be covered under the same warranty for a period of ten (10) years. The warranty shall be comprehensive in nature. No deductions shall be allowed for travel time, service hours, repair parts cost, and etc. during the minimum noted warranty period described above.

1.5 COORDINATION OF MOUNTING

A. Should drawings indicate floor mounting requirements, the size and location of concrete bases and anchor bolt inserts shall be coordinated. Concrete, reinforcement and formwork must meet the requirements specified in Division for said Work.

PART 2 - EXECUTION

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ITEC Series by Cummins Power Generation

B. Equipment specifications for this Project are based on automatic transfer switches manufactured by Cummins Power Generation. Switches manufactured by others that meet the requirement of this specification are acceptable, if approved not less than two weeks before scheduled bid date. Proposals must include a line-by-line compliance statement based on this specification.

C. Transfer switches utilizing molded case circuit breakers do not meet the requirements of this specification and will not be accepted.

2.2 GENERAL TRANSFER-SWITCH PRODUCT REQUIREMENTS

A. Provide transfer switches in the number and ratings that are shown on the drawings. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer.

B. Fault-Current Rating and Withstand Ratings: UL 1008 MCR ratings shall be specifically listed as meeting the requirements for use with protective devices at installation locations, under specified fault conditions. Withstand and closing ratings shall be based on use of the same set of contacts for the withstand test and the closing test.

C. Solid-State Controls: All settings should be accurate to +/- 2% or better over an operating temperature range of -40 to +60 degrees C (-40 to +140 degrees F).

D. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.

E. Electrical Operation: Accomplished by a non-fused, momentary energized solenoid or electric motor operator mechanism, mechanically and electrically interlocked in both directions (except that mechanical interlock is not required for closed transfer switches).

F. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.

1. Switches using molded-case switches or circuit breakers, or insulated case circuit breaker components are not acceptable.

2. Transfer switches shall be double-throw, electrically and mechanically interlocked, and mechanically held in the Source 1 and Source 2 positions.

3. Main switch contacts shall be high-pressure silver alloy. Control assemblies shall have arc chutes for position arc extinguishing. Arc chutes shall have insulating covers to prevent inter-phase flashover.

4. Contacts shall be operated by a high-speed electrical mechanism that causes contacts to open or close within three electrical cycles from signal.

5. The transfer switch operation shall include the ability to switch to an open position (both sources disconnected) for the purpose of load shedding from the generator set.

6. The power transfer mechanism shall include provisions for manual operation under load with the enclosure door closed. Manual operation may be electromechanical or mechanical, but must be coordinated with control function.

7. Transfer switch shall be provided with flame-retardant transparent covers to allow viewing of switch contact operation but prevent direct contact with components that could be operating at line voltage levels.

8. The transfer switch shall include the mechanical and control provisions necessary to allow the device to be field-configured for operating speed. Transfer switch operation with motor loads shall be as recommended in NEMA MCI.

9. Transfer switches designated on the drawings as "4-pole" shall be provided with a switched neutral pole switched which is switched simultaneously with phase poles.

10. Transfer switches designated on the drawings as "3-pole" shall have a full current-rated neutral bar with lug.

11. Transfer switches designated on the drawings as "bypass-isolated" switches shall meet the requirements of section 2.4 of this specification.

12. Transfer switches designated on the drawings as "non-automatic" switches shall meet the requirements of section 2.5 of this specification.

13. Transfer switches designated on the drawings as "closed transfer" switches shall meet the requirements of section 2.6 of this specification.

14. Transfer switches designated on the drawings as "service entrance" switches shall meet the requirements of section 2.7 of this specification.

D. Control: Transfer switch control shall be capable of communicating with the general control, other switches and remote programming devices over a high-speed network interface.

1. Factory wiring: Transfer switch internal wiring shall be composed of pre-manufactured harnesses that are permanently marked for source and destination. Harnesses shall be connected to the control system by means of locking disconnect plug(s), to allow the control system to be easily disconnected and serviced without disconnecting power from the transfer switch mechanism.

1. Terminals: Terminals shall be pressure type and appropriate for all field wiring. Terminal arrangement and cabinet space must be such that feeder conductors can enter from the top, side or bottom of the switch, at the installer's discretion. Control wiring shall be equipped with suitable lugs, for connection to terminal strips.

2. Enclosures: All enclosures shall be third-party certified for compliance to NEMA ICS 6 and UL 508, unless otherwise indicated:

1. The enclosure shall provide wire bend space in compliance to the latest version of NFPA70, regardless of the direction from which the conduit enters the enclosure.

2. Exterior cabinet doors shall provide complete protection for the system's internal components. Doors must have permanently mounted key-type latches. Bolted covers or doors are not acceptable.

3. Transfer switches shall be provided in enclosures that are third party certified for their intended environment per NEMA requirements.

a. Transfer switches installed in a controlled indoor environment shall be provided in NEMA Type 1 enclosures (IEC type IP20).

b. Transfer switches installed indoors shall be NEMA Type 12 (IEC type IP66) if the Project environment requires dust-proof and/or drip-proof equipment.

c. Transfer switches located outdoors shall be supplied in NEMA Type 3R (IEC IP34) when dust-proof and/or rain-proof enclosures are required.

d. Transfer switches that are located outdoors or in any other uncontrolled environment shall be supplied with NEMA Type 4 or 4X (stainless steel) enclosures (IEC IP55).

2.3 AUTOMATIC TRANSFER SWITCHES

A. Comply with requirements for Level 1 equipment as required by NFPA 110.

B. Indicated current ratings:

1. Refer to the Project drawings for specifications on the sizes and types of transfer switch equipment, withstand and closing ratings, number of poles, voltage and ampere ratings, enclosure type, and accessories.

2. Main contacts shall be rated for 600 VAC minimum.

3. Transfer switches shall be rated to carry 100% of rated current continuously in the enclosure supplied, in ambient temperatures of -40 to +60 degrees C (-40 to +140 degrees F), relative humidity up to 95% (non-condensing), and altitude up to 10,000 feet (3,000 meters).

C. Manual Switch Operation: The power transfer mechanism shall include provisions for manual operation under load with the enclosure door closed. Manual operation may be electromechanical or mechanical, but must be coordinated with control function.

D. Relay Signal: Control shall include provisions for addition of a pre-transfer relay signal, adjustable from 0 to 60 seconds, to be provided if necessary for elevator operation, based on equipment provided for the project.

E. Control: Transfer switch control shall be provided with necessary equipment and software to communicate with the general control, other switches, remote annunciation equipment, and other devices over a high speed control network.

F. Neutral Switching: Transfer switches designated on the drawings as 4-pole shall be provided with a switched neutral pole. The neutral pole shall be of the same construction and have the same ratings as the phase poles. All poles shall be switched simultaneously using a common operator. Submittable equipment using overlapping neutral contacts is not acceptable.

G. Transfer switches that are designated on the drawings as 3-pole shall be provided with a neutral bus and lug. The neutral bus shall be rated to carry 100% of the current designated on the switch rating.

H. The transfer switch physically located closest to the generator and not more than 50 ft (15 meters) away, except those served by generator paralleling equipment, shall be provided with a battery charger suitable for the requirements of the application and in compliance with NFPA 110 requirements for Level 1 systems. If no transfer switch is located within this distance, a battery charger shall be installed on the generator set.

2.4 AUTOMATIC TRANSFER SWITCH CONTROL SYSTEMS

1. The transfer switch control system shall be configurable in the field for any operating voltage level up to 600 VAC. Voltage sensing shall be monitored based on the normal voltage of the site. Systems that utilize voltage monitoring based on standard voltage conditions that are not field configurable are not acceptable.

2. All transfer switch sensing shall be configurable from an operator panel or from a Windows XP or later PC-based service tool. Design utilizing DIP switches or other electromechanical devices are not acceptable.

3. The transfer switch shall be configurable to accept a relay contact signal and a network signal from an external device for load shedding purposes. On receipt of this signal, the transfer switch shall switch to a neutral position when connected to Source 2. If Source 1 is available when the load-shed signal is received, the transfer switch shall connect to Source 1.

4. The transfer switch shall be configurable to accept a relay contact signal and a network signal from an external device to prevent transfer to the generator source.

5. The transfer switch shall provide a relay contact signal prior to transfer or re-transfer. The time period before and after transfer shall be adjustable in a range of 0 to 50 seconds.

6. The control system shall be designed and prototype tested for operation in ambient temperatures from -40 degrees to +60 degrees C (-40 to +140 degrees F). It shall be designed and tested to comply with the requirements of the listed voltage and RFI/EMV standards.

7. The control system shall have electrically isolated logic inputs, high isolation transformers for AC inputs and relays on all outputs, to provide optimum protection from line voltage surges, RFI and EMI.

8. The transfer switch network monitoring equipment, when applied, shall be provided with a battery-based auxiliary power supply to allow monitoring of the transfer switch when both AC power sources are non-operational. The battery power supply shall be monitored for proper condition, and the transfer switch shall include an alarm condition to indicate low battery condition.

9. Transfer Switch Control Panel: The transfer switch shall have a microprocessor-based control with a sealed membrane panel incorporating pushbuttons for operator-controlled functions, and LED lamps for system status indicators. The panel shall also include an alphanumeric display for detailed system information. Panel display and indicating lamps shall include permanent LEDs.

1. The indicator panel LEDs shall display:

a. Which source the load is connected to (Source 1 or Source 2)

b. Which source or sources are available

c. When switch is not set for automatic operation, because the control is disabled or the bypass switch is in use

d. When the switch is in test/exercise mode

2. The indicator shall have pushbuttons that allow the operator to activate the following functions:

a. Activate pre-programmed test sequence

b. Override programmed delays, and immediately go to the next operation

c. Reset the control by clearing any faults

d. Test all of the LEDs by lighting them simultaneously

3. The alphanumeric digital display shall be vacuum fluorescent-type, clearly visible in both bright sunlight and no-light conditions over an angle of 120 degrees, and shall display the following:

a. AC voltage for all phases, normal and emergency

b. Source status: connected or not connected

c. Load data, including voltage, AC current, frequency, kW, kVA, and power factor.

4. The display panel shall be password-protected, and allow the operator to view and make adjustments:

a. Set nominal voltage and frequency for the transfer switch

b. Adjust voltage and frequency sensor operation set points

c. Set up time clock functions

d. Enable or disable control functions including program transition

e. View real-time clock data, operation lag (hours connected, times transferred, failures) and service history

f. View real-time clock data, operation lag (hours connected, times transferred, failures) and service history

K. Control Functions: Functions managed by the control shall include:

1. Software adjustable time delays:

a. Engine start (operator's assistance general starts in the event of momentary power fluctuation): 0 to 120 seconds (default 3 sec)

b. Transfer normal to emergency (allows general to stabilize before load is transferred): 0 to 120 seconds (default 3 sec)

c. Re-transfer emergency to normal (allows utility to stabilize before load is transferred from genset): 0 to 30 minutes (default 3 sec)

d. Engine cooldown: 0 to 30 minutes (default 10 min)

e. Programmed ignition: 0 to 60 seconds (default 3 sec)

2. Under-voltage sensing: three-phase normal, three-phase emergency source.

a. Pickup: 85 to 98% of nominal voltage (default 90%)

b. Dropout: 75 to 98% of nominal voltage (default 90%)

c. Dropout time delay: 0.5 to 1.0 seconds (default 0.5 sec)

d. Accurate to within +/- 1% of nominal voltage

3. Over-voltage sensing: three-phase normal, three-phase emergency source.

a. Pickup: 90 to 99% of dropout setting (default 90%)

b. Dropout: 100 to 105% of nominal voltage (default 110%)

c. Dropout time delay: 0.5 to 1.0 seconds (default 0.5 sec)

d. Accurate to within +/- 1% of nominal voltage

4. Over/under frequency sensing:

a. Pickup: +/- 5 Hz +/- 0.02% of nominal frequency (default 100)

b. Dropout: +/-1% beyond pickup (default 1%)

c. Dropout time delay: 0.1 to 1.0 seconds (default 0.5 sec)

d. Accurate to within +/- 0.2%

5. Voltage imbalance sensing:

a. Dropout: 2 to 10% (default 4%)

b. Pickup: 90% of dropout

c. Time delay: 2.0 to 20 seconds (default 5 sec)

6. Phase rotation sensing:

a. Time delay: 100 msec

7. Loss of single-phase detection:

a. Time delay: 100 msec

L. Control features shall include:

1. Programmable genset exercise: A field-programmable control shall periodically start the generator, transfer the load to generator for a preset time, then re-transfer and shut down the generator after a preset cool-down period.

a. Push-button programming control shall have a selection of eight different schedules for exercising generator, with or without load.

2. In event of a loss of power to the control, all control settings, real-time clock setting and the engine start-time delay setting will be retained.

3. The system continuously logs information including the number of hours each source has been connected to the load, the number of times transferred, and the total number of times each source has failed. An event recorder stores information, including time and date-stamps, for up to 50 events.

4. Transfer Override Switch: Overrides automatic re-transfer control so automatic transfer switch will remain connected to emergency power source regardless of condition of normal source. Pilot light to indicate override status.

M. Control Interface

1. Provide one set Form C auxiliary contacts on both sides, operated by transfer switch position, rated 10 amp 250 VAC.

2. The transfer switch shall be provided with a network communication card, and configured to allow network-based communication with the transfer switch and other network system components, including the generator set(s) provided for the Project.

3. Unassigned Auxiliary Contacts: Two normally open, 1-pole, double-throw contacts for each switch position, rated 10A at 240 VAC.

N. Engine Starting Contacts

1. One isolated and normally closed, and one isolated and normally open; rated 10A at 32 VDC minimum.

2.4 SERVICE ENTRANCE TRANSFER SWITCHES

A. Transfer switches must be specifically intended for service entrance applications, and labeled "Suitable for service entrance use only"

B. Transfer switch shall meet NEC requirements for emergency, legally required and standby applications as specified in UL 1008.

C. Entire transfer switch including enclosure must be listed and labeled to UL 1008, switches with only the mechanism listed are not acceptable.

D. Molded case circuit breaker must be UL 489 listed.

2.5 REMOTE ANNUNCIATOR SYSTEM

A. Functional Description: Remote annunciation panel shall annunciate conditions for indicated transfer switches. Annunciation shall include the following:

1. Sources available, as defined by actual pickup and dropout settings of transfer-switch controls.

2. Switch position.

3. Switch in test mode.

4. Failure of communication link.

B. Annunciator Panel: LED-lamp type with audible signal and silencing switch.

1. Indicating Lights: Grouped for each transfer switch monitored.

2. Label each group, indicating transfer switch it monitors, location of switch, and identity of load it serves.

3. Mounting: Flush, modular, steel cabinet, unless otherwise indicated.

4. Lamp Test: Push-to-test or lamp-test switch on front panel.

C. Malfunction of annunciation, annunciation and control panel, or communication link shall not affect functions of automatic transfer switch. In the event of failure of communication link, automatic transfer switch automatically returns to stand-by, self-protected operation.

D. Automatic transfer-switch sensing, controlling, or operating function shall not depend on remote panel for proper operation. The remote annunciation system shall not prevent transfer to the alternate source when the primary power source fails, nor prevent return to the primary source if the alternate source fails.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Design each fastener and support to carry load indicated by seismic requirements and according to seismic-restraint details within other sections of the Specifications.

B. Floor-Mounting Switch: Anchor to floor by bolting.

1. Floor-mounted transfer switches (except drawer switches supported by wheeled carriages, which must be rated out of floor level) shall be mounted on concrete bases complying with the following requirements:

a. Concrete Bases: 4 inches (100 mm) high, reinforced, with chamfered edges. Extend base no more than 4 inches (100 mm) in all directions beyond the maximum dimension of switch, unless otherwise indicated or unless required for seismic support. Construct concrete bases according to Division 26 Section "Brackets and Supports for Electrical Systems."

C. Annunciator and Control Panel Mounting: Flush in wall, unless otherwise indicated.

D. Identify components according to Division 26 Section "Identification for Electrical Systems."

E. Set field-adjustable intervals and delay, relay, and engine exercise clock.

3.2 CONNECTIONS

A. Wiring to Remote Components: Match type and number of cables and conductors to control and communication requirements of transfer switches as recommended by manufacturer. Increase raceway size at no

**EXISTING PANEL D** VOLTAGE 120 / 208 V SIZE 200A. MLO CABINET SURFACE NEMA-1  
PHASE 3 PH 200A. BUS RATING EXISTING AIC RATED  
4 W

NOTES	REMARKS	CKT.BKR	VA PHASE LOAD			BUS	VA PHASE LOAD			CKT.BKR	REMARKS	NOTES				
			AMPS	P	A		B	C	A				B	C	AMPS	P
	EXISTING LTG.	20	1	1200		1	X		2	1200		1	EXISTING LTG.			
	EXISTING LTG.	20	1	1200		3	X		4	1200		20	1	EXISTING LTG.		
	EXISTING LTG.	20	1	1200		5	X		6	1200		20	1	EXISTING LTG.		
	EXISTING RECEPTS.	20	1	900		7	X		8	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		9	X		10	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		11	X		12	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		13	X		14	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		15	X		16	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		17	X		18	900		30	2	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		19	X		20	1500		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		21	X		22	1500		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		23	X		24	1500		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		25	X		26	1500		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		27	X		28	1500		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		29	X		30	1500		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		31	X		32	1500		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		33	X		34	1500		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		35	X		36	1500		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		37	X		38	1500		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		39	X		40	1500		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		41	X		42	1500		20	1	EXISTING RECEPTS.		
	TOTAL			10490		10490			10490			12090	11490	11690	TOTAL	

NB = NEW BREAKER SHALL BE COMPATIBLE WITH EXISTING PANELBOARD AND SHALL MATCH PANELBOARD AIC RATING.  
EB = REUSE EXISTING BREAKER.

NOTE:  
CONTRACTOR IS RESPONSIBLE FOR UPDATING ALL PANEL SCHEDULES WITH CURRENT DESCRIPTIONS OF ALL BRANCH CIRCUIT DESIGNATIONS.

TABULATION	TOTAL LOAD	DEMAND FACTOR	DEMAND LOAD
MEASURED			
LIGHTING	6000	1.25	7500
COOLING	4140		
HEATING	37140	1.00	37140
RECEPTACLE	19800	0.75	14900
MISCELLANEOUS	3800	1.00	3800
KITCHEN EQUIP			
LARGEST MOTOR			
TOTAL DEMAND LOAD			63340 VA
TOTAL DEMAND AMPS			175.8 A

**EXISTING PANEL B** VOLTAGE 120 / 208 V SIZE 200A. MLO CABINET SURFACE NEMA-1  
PHASE 3 PH 200A. BUS RATING EXISTING AIC RATED  
4 W

NOTES	REMARKS	CKT.BKR	VA PHASE LOAD			BUS	VA PHASE LOAD			CKT.BKR	REMARKS	NOTES				
			AMPS	P	A		B	C	A				B	C	AMPS	P
	EXISTING LTG.	20	1	1200		1	X		2	1200		20	1	EXISTING LTG.		
	EXISTING LTG.	20	1	1200		3	X		4	1200		20	1	EXISTING LTG.		
	EXISTING LTG.	20	1	1200		5	X		6	1200		20	1	EXISTING LTG.		
	EXISTING RECEPTS.	20	1	1200		7	X		8	1200		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	1200		9	X		10	1200		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	1200		11	X		12	1200		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		13	X		14	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		15	X		16	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		17	X		18	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		19	X		20	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		21	X		22	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		23	X		24	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		25	X		26	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		27	X		28	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		29	X		30	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		31	X		32	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		33	X		34	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		35	X		36	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		37	X		38	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		39	X		40	900		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	900		41	X		42	900		20	1	EXISTING RECEPTS.		
	TOTAL			8017		8017			8017			16000	15700	15700	TOTAL	

NB = NEW BREAKER SHALL BE COMPATIBLE WITH EXISTING PANELBOARD AND SHALL MATCH PANELBOARD AIC RATING.  
EB = REUSE EXISTING BREAKER.

NOTE:  
CONTRACTOR IS RESPONSIBLE FOR UPDATING ALL PANEL SCHEDULES WITH CURRENT DESCRIPTIONS OF ALL BRANCH CIRCUIT DESIGNATIONS.

TABULATION	TOTAL LOAD	DEMAND FACTOR	DEMAND LOAD
MEASURED			
LIGHTING	10800	1.25	13500
COOLING	8051		
HEATING	36051	1.00	36051
RECEPTACLE	24300	0.71	17150
MISCELLANEOUS			
KITCHEN EQUIP			
LARGEST MOTOR			
TOTAL DEMAND LOAD			66701 VA
TOTAL DEMAND AMPS			185.1 A

**EXISTING PANEL MDP** VOLTAGE 120 / 208 V SIZE 1200A. MCB CABINET SURFACE NEMA-1  
PHASE 3 PH 1200A. BUS RATING EXISTING AIC RATED  
4 W

NOTES	REMARKS	CKT.BKR	VA PHASE LOAD			BUS	VA PHASE LOAD			CKT.BKR	REMARKS	NOTES				
			AMPS	P	A		B	C	A				B	C	AMPS	P
	EXISTING LTG.	20	1	4680		1	X		2	4680		20	1	EXISTING LTG.		
	EXISTING LTG.	20	1	4680		3	X		4	4680		20	1	EXISTING LTG.		
	EXISTING LTG.	20	1	4680		5	X		6	4680		20	1	EXISTING LTG.		
	EXISTING RECEPTS.	20	1	11280		7	X		8	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		9	X		10	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		11	X		12	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		13	X		14	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		15	X		16	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		17	X		18	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		19	X		20	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		21	X		22	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		23	X		24	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		25	X		26	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		27	X		28	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		29	X		30	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		31	X		32	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		33	X		34	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		35	X		36	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		37	X		38	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		39	X		40	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		41	X		42	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		43	X		44	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		45	X		46	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		47	X		48	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		49	X		50	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		51	X		52	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		53	X		54	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		55	X		56	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		57	X		58	11280		20	1	EXISTING RECEPTS.		
	EXISTING RECEPTS.	20	1	11280		59	X		60	11280		20	1	EXISTING RECEPTS.		
	TOTAL			92997		90717			90617			68686	69206	68646	TOTAL	

NB = NEW BREAKER SHALL BE COMPATIBLE WITH EXISTING PANELBOARD AND SHALL MATCH PANELBOARD AIC RATING.  
EB = REUSE EXISTING BREAKER.

NOTE:  
CONTRACTOR IS RESPONSIBLE FOR UPDATING ALL PANEL SCHEDULES WITH CURRENT DESCRIPTIONS OF ALL BRANCH CIRCUIT DESIGNATIONS.

TABULATION	TOTAL LOAD	DEMAND FACTOR	DEMAND LOAD
MEASURED			
LIGHTING	49600	1.25	62000
COOLING	129990		
HEATING	182292	1.00	182292
RECEPTACLE	92160	0.55	51080
MISCELLANEOUS	49120	1.00	49120
KITCHEN EQUIP			
LARGEST MOTOR			
TOTAL DEMAND LOAD			344492 VA
TOTAL DEMAND AMPS			956.2 A

**NEW PANEL E** VOLTAGE 120 / 208 V SIZE 400A. MLO CABINET SURFACE NEMA-1  
PHASE 3 PH 400A. BUS RATING 65,000 AIC RATED  
4 W

NOTES	REMARKS	CKT.BKR	VA PHASE LOAD			BUS	VA PHASE LOAD			CKT.BKR	REMARKS	NOTES			
			AMPS	P	A		B	C	A				B	C	AMPS
	EXISTING LTG.	20	1	1200		1	X		2	1200		20	1	EXISTING LTG.	
	EXISTING LTG.	20	1	1200		3	X		4	1200		20	1	EXISTING LTG.	
	EXISTING LTG.	20	1	1200		5	X		6	1200		20	1	EXISTING LTG.	
	EXISTING LTG.	20	1	1200		7	X		8	1200		20	1	EXISTING LTG.	
	EXISTING LTG.	20	1	1200		9	X		10	1200		20	1	EXISTING LTG.	
	EXISTING LTG.	20	1	1200		11	X		12	1200		20	1	EXISTING LTG.	
	EXISTING RECEPTS.	20	1	900		13	X		14	900		20	1	EXISTING RECEPTS.	
	EXISTING RECEPTS.	20	1	900		15	X		16	900		20	1	EXISTING RECEPTS.	
	EXISTING RECEPTS.	20	1	900		17	X		18	900		20	1	EXISTING RECEPTS.	
	EXISTING RECEPTS.	20	1	900		19	X		20	900		20	1	EXISTING RECEPTS.	
	EXISTING RECEPTS.	20	1	900		21	X		22	900		20	1	EXISTING RECEPTS.	
	EXISTING RECEPTS.	20/20		900		23	X		24	900					





SPARKMAN  
ARCHITECTS  
2163 MAIN STREET  
SARASOTA, FL 34237

SWEET  
T 941.952.0084  
F 941.952.0201  
FL AA26000857



HIGHLANDS COUNTY BOARD OF COUNTY COMMISSIONERS  
HIGHLANDS COUNTY HEALTH DEPARTMENT- HVAC UPGRADE  
AND ADA RESTROOM/SHOWER  
GEORGE B. LUKASIK BLDG.  
SEBRING, FLORIDA, 33870  
PROJECT TITLE:  
ISSUED FOR:  
100% CONSTRUCTION DOCUMENTS  
09/17/18

PLUMBING FIXTURE AND PIPE SIZING SCHEDULE							
MARK	FIXTURE	TRAP	VENT	COLD	HOT	DESCRIPTION	APPROVED MANUFACTURERS
P-1	WATER CLOSET BARRIER FREE	INTEGRAL	AS SHOWN ON PLANS	1"	----	WATER CLOSET: FLOOR MOUNTED, FLUSH VALVE, ELONGATED, WHITE VITREOUS CHINA, SIPHON JET, 1 1/2" TOP SPUD, BOLT CAPS, 1.28 GPF, 16 1/2" HIGH (MIN.) FLUSH VALVE: NON-HOLD OPEN, LOW FORCE, ADA COMPLIANT HANDLE, EXPOSED DIAPHRAGM, 1" IPS SCREWDRIVER ANGLE STOP WITH PROTECTIVE CAP, VACUUM BREAKER FLUSH CONN., ADJUSTABLE TAILPIECE, 1 1/2" TOP SPUD, CAST WALL FLANGE WITH SET SCREW AND SWEAT SOLDER ADAPTER CONTROLS FOR FLUSH VALVE SHALL BE MOUNTED ON WIDE SIDE OF TOILET AREAS. SEAT: FINISH WHITE, EXTRA HEAVY DUTY PLASTIC FOR ELONGATED BOWL, OPEN FRONT LESS COVER, SELF- SUSTAINING STAINLESS STEEL CHECK HINGE, TOP OF SEAT 17 1/2" (MIN.)	AMERICAN STANDARD MADERA NO. 3043.001 KOHLER HIGHLINE NO. K-4405  SLOAN-ROYAL NO. 111-1.28 ZURN AQUAVANTAGE NO. Z6000AV-HET  OLSONITE NO. 955SCT BEMIS NO. 1655SSC
P-2	LAVATORY BARRIER FREE	1 1/4"		1/2"	1/2"	LAVATORY: WALL HUNG, 20x18, WHITE VITREOUS CHINA, FRONT OVERFLOW AND HOLES ON 8" CENTERS, RIM 34" AFF  TRIM: LAVATORY FAUCET, WITH 8" CENTERS, 5"+ GOOSENECK SPOUT, 4" WRIST BLADE HANDLES, PERFORATED GRID DRAIN w/OFFSET 1 1/4" TAIL PIECE. PROVIDE STOPS, SUPPLIES, TRAP, ETC. TO MAKE A COMPLETE INSTALLATION. PROVIDE WITH 0.5 FLOW CONTROL AERATOR. CARRIER: DURA-COATED RECTANGULAR STEEL UPRIGHTS WITH WELDED FEET, ADJUSTABLE TOP SUPPORT PLATE, MOUNTING FASTENERS, CONCEALED ARMS, STEEL SLEEVES & ALIGNMENT TRUSS	AMERICAN STANDARD LUCERNE NO. 0356.015 KOHLER KINGSTON NO. K-2006  DELTA NO. 3579-WFHF CHICAGO NO. 786-E3CP  ZURN NO. Z-1231 WATTS NO. TCA-411 J. R. SMITH NO. 700
P-3	SHOWER BARRIER FREE	2" FD		1/2"	1/2"	SHOWER: PRESSURE BALANCING MIXING VALVE WITH INTEGRAL VOLUME CONTROL AND ADJUSTABLE STOP SCREW TO LIMIT HANDLE TURN, INTEGRAL CHECK STOPS, IN-LINE VACUUM BREAKER, SINGLE BLADE LEVER HANDLE, WALL/HAND SHOWER WITH FLEXIBLE METAL HOSE, WALL CONNECTION AND FLANGE. SLIDE BAR FOR HAND SHOWER	SYMMONS NO. 96-500-B30-L-V-X (TEMP-TROL) LEONARD NO. 4505-H-06

**PLUMBING FIXTURE NOTES:**

1. MOUNTING HEIGHT AS PER ARCHITECT.
2. TRAPS, SUPPLIES AND ALL OTHER EXPOSED PIPING SHALL BE CAST BRASS WITH A POLISHED CHROME FINISH. ACCEPTABLE MANUFACTURERS INCLUDE McGUIRE OR APPROVED EQUAL.
3. ALL EXPOSED PIPING BELOW BARRIER FREE FIXTURES SHALL BE INSTALLED WITH ADA COMPLIANT PIPE WRAP KIT. SYSTEM SHALL BE PVC RESIN SEAMLESS CONSTRUCTION MFG BY PRO-WRAP OR APPROVED EQUAL.
4. FAUCETS WITH WRIST BLADE HANDLES SHALL PROVIDE 1/4 TURN FULL OPEN TO FULL CLOSED OPERATION.
5. MAINTAIN 1 1/2" (MIN) CLEAR FROM THE BOTTOM OF GRAB BAR AND TOP OF FLUSH VALVE.
6. LAVATORIES SHALL BE INSTALLED WITH FLOOR MOUNTED CARRIERS AT STUD WALLS ATTACHED DIRECTLY TO BLOCK WALLS.
7. PROVIDE FLUSH CONTROLS ON THE WIDE SIDE OF TOILETS.

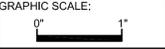
PLUMBING ACCESSORY SCHEDULE			
MARK	FIXTURE	DESCRIPTION	APPROVED MANUFACTURERS
ECO	EXTERIOR CLEANOUT	EXTERIOR CLEANOUT: HEAVY DUTY DURA-COATED CAST IRON BODY WITH ROUND CAST IRON SCORIATED TOP, ADJUSTABLE GAS AND WATER TIGHT BRONZE THREADED PLUG	ZURN-LC NO. C02510-P04 WATTS NO. C05-2-NH
FD	FLOOR DRAIN (SHOWERS)	FLOOR DRAIN: 4" ROUND STAINLESS STEEL STRAINER, PVC BODY, ADJUSTABLE TOP & CLAMPING COLLAR. PROVIDE WITH DEEP SEAL TRAP.	ZURN-LC NO. FD2254-PV2-FMT WATTS NO. SD-PVC

**PLUMBING GENERAL NOTES:**

- CONTRACTOR SHALL PROVIDE COMPLETE PLUMBING SYSTEMS AS DETAILED. WORK CONSISTS OF FURNISHING ALL MATERIALS, EQUIPMENT, AND SERVICES REQUIRED FOR COMPLETE SYSTEMS.
- FLOOR PLANS SHOW APPROXIMATE LOCATION AND LAYOUT OF EXISTING PIPING ETC. CONTRACTOR SHALL VERIFY THE LOCATION OF THE SANITARY, WATER SERVICE AND VENTING SYSTEM PRIOR TO STARTING WORK.
- CONTRACTOR SHALL COORDINATE ALL PIPING LOCATIONS AND INVERT ELEVATIONS WITH FOOTINGS AND FOUNDATIONS BEFORE INSTALLING AND ADJUST AS REQUIRED.
- ARCHITECTURAL DRAWINGS TAKE PRECEDENCE OVER PLUMBING DRAWINGS WITH REFERENCE TO BUILDING CONSTRUCTION. PLUMBING DRAWINGS (PLANS, DIAGRAMS, ETC.) ARE DIAGRAMMATIC AND SHOULD NOT BE SCALED. THE CONTRACTOR SHALL COORDINATE ALL WORK UNDER THIS CONTRACT.
- COORDINATE WORK WITH OTHER TRADES TO AVOID CONFLICTS.
- IF ANY DISCREPANCIES SHOULD EXIST THE CONTRACTOR SHALL NOTIFY THE ARCHITECT PRIOR TO BIDDING.
- NECESSARY REQUIRED PLUMBING ITEMS THAT ARE NOT SHOWN ON THE DRAWINGS DOES NOT RELIEVE THE CONTRACTOR FROM HIS RESPONSIBILITY TO INSTALL A COMPLETE OPERATING PLUMBING SYSTEM.
- PROVIDE ALL CUTTING REQUIRED FOR THE INSTALLATION OF PLUMBING WORK. FINISH PATCHING SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR.
- WATER PIPING ABOVE GRADE SHALL BE: CHLORINATED POLYVINYL CHLORIDE (CPVC), SDR 11, ASTM D-2846, RATED AT A CONTINUOUS WORKING PRESSURE OF 100 PSI AT 180°F. FITTING SHALL BE SOLVENT WELDED WITH AN ASTM APPROVED SOLVENT SYSTEM. DO NOT BEND PIPE WITH OVER A 45° ANGLE.
- INSULATE ALL HOT WATER AND HOT WATER RETURN PIPING WITH 1" THICK HIGH DENSITY FIBERGLASS INSULATION WITH, FACTORY APPLIED VAPOR BARRIER ALL SERVICE JACKET.
- ALL SOIL, WASTE, AND VENT PIPING SHALL BE SCHEDULE 40 PVC.
- ALL HORIZONTAL SOIL AND WASTE PIPING 2 1/2" IN DIAMETER AND LESS SHALL HAVE A SLOPE OF 1/4" PER ONE FOOT LENGTH OF PIPE. ALL PIPING 3" IN DIAMETER AND LARGER SHALL HAVE A SLOPE OF 1/8" PER ONE FOOT LENGTH OF PIPE.
- UNLESS OTHERWISE NOTED ALL PIPING SHALL BE RUN IN CONCEALED SPACES.
- IDENTIFY ALL PIPING WITH PERMANENT MARKERS.
- ALL PIPING SHALL BE SUPPORTED RIGIDLY AND IN LINE FROM BUILDING STRUCTURE. OFFSET PIPING TO AVOID STRUCTURAL MEMBERS, CANTS, FLASHING, MECHANICAL AND ELECTRICAL EQUIPMENT, ETC.
- FINAL PIPING ROUTING SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR.
- ALL FIXTURES AND EQUIPMENT SHALL HAVE SHUT-OFF VALVES AT OR NEAR EQUIPMENT.
- PROVIDE CHROME PLATED STOPS AND SUPPLIES AT ALL WATER CLOSETS AND LAVATORIES.
- CHROME PLATED ESCUTCHEONS AND NIPPLES ARE REQUIRED AT ALL FLOOR AND WALL PENETRATIONS.
- ALL FIXTURES AND EQUIPMENT SHALL HAVE SHUT-OFF VALVES AT OR NEAR EQUIPMENT.
- GATE VALVES SHALL BE #125 BRONZE WITH UNION BONNET.
- PROVIDE AND INSTALL HAMMER ARRESTORS AT FIXTURE GROUPS. INSTALL AIR CHAMBERS AT INDIVIDUAL FIXTURES.
- PLUMBING CONTRACTOR SHALL ARRANGE TO PAY FOR ALL NECESSARY PERMITS, LICENSES, AND INSPECTIONS AS REQUIRED BY THE CITY.
- ALL NEW PLUMBING EQUIPMENT, MATERIALS, AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM DATE OF ACCEPTANCE.
- MAINTAIN AS-BUILT DRAWINGS, DAILY. SUBMIT TO ARCHITECT/OWNER AFTER COMPLETION OF ALL WORK.
- AT THE COMPLETION OF THE INSTALLATION OF THE NEW POTABLE WATER SYSTEM, THE ENTIRE SYSTEM SHALL BE DISINFECTED IN COMPLIANCE WITH SECTION 610 OF THE STANDARD PLUMBING CODE.
- THOROUGHLY FLUSH & TEST EXISTING UNDERGROUND SANITARY PIPING. TEST TO INCLUDE A VISUAL INSPECTION OF FLOW.
- ALL WORK SHALL COMPLY WITH ALL LOCAL AND STATE CODES, INCLUDING THE FLORIDA BUILDING CODE, 2017 EDITION.
- TO THE BEST OF THE ARCHITECT'S OR ENGINEER'S KNOWLEDGE, THE PLANS AND SPECIFICATIONS COMPLY WITH THE MINIMUM BUILDING CODES.

PLUMBING LEGEND		
DESCRIPTION	ABBREV.	SYMBOL
SANITARY PIPING	SS	_____
VENT PIPING	V	_____
COLD WATER PIPING	CW	_____
HOT WATER PIPING	HW	_____
HOT WATER RETURN PIPING	HWR	_____
EXISTING PIPING TO REMAIN	-	---/---/---
VENT THRU ROOF	VTR	_____
EXTERIOR CLEAN OUT	ECO	
FLOOR DRAIN	FD	
BALANCING VALVE	-	
SHUT-OFF VALVE	-	
NEW CONNECTION	-	

REV	DESCRIPTION	DATE



SCALE:  
PROJECT MANAGER: TMS  
DRAWN BY: TAC  
A/E OF RECORD: TMS  
PROJECT NO: 18498  
SHEET TITLE:

**PLUMBING NOTES, SCHEDULES AND LEGEND**

SHEET No.:  
**P1.0**

