# CITY OF ANN ARBOR

# FIRE STATION No.1 GENERATOR REPLACEMENT

111 N. 5TH AVE.

ANN ARBOR, MICHIGAN 48104



# DICLEMENTE SIEGEL DESIGN INC.

28105 GREENFIELD ROAD SOUTHFIELD, MICHIGAN 48076-3046



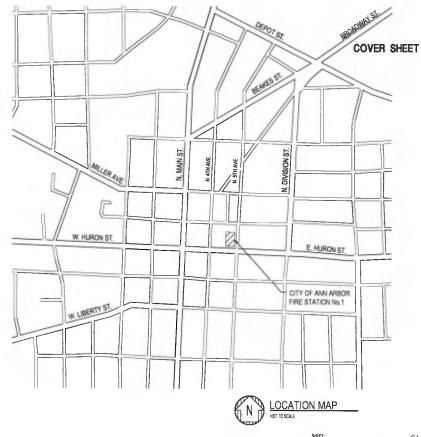
DESAI NASR

6765 DALY ROAD WEST BLOOMFIELD, MI 48322-4585

DNCE PROJECT No. 9550-03

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ENGINEERING AND ARCHITECTURE



	INODECTION TO THE	INSPECTION F	REQUENCY	REFERENCED	IBO DEFEDENCE	RESPONSIBL
	INSPECTION TASK	CONTINUOUS	PERIODIC	STANDARD	IBC REFERENCE	AGENT
ON OF B	OLTING					
INSPEC	CTION TASKS PRIOR TO BOLTING:					
Α	MANUFACTURER'S CERTIFICATIONS AVAILABLE FOR FASTENER MATERIALS.	0	Р			
8.	FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS.	0	0			
C	PROPER FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FROM SHEAR PLANE).	0	0	AISC 360,		
D,	PROPER BOLTING PROCEDURE SELECTED FOR JOINT DETAIL.	0	0	SECTION N5, YABLE N5.6-1	1705.2	SI/TA
E.	CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS.	0	0	ABLE N3.0-1		
F.	PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED.	р	0			
G	PROPER STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS AND OTHER FASTENER COMPONENTS.	0	0			
A.	CTION TASKS DURING BOLTING:					
~	FASTENER ASSEMBLIES, OF SUITABLE CONDITION, PLACED IN ALL HOLES AND WASHERS (IF REQUIRED) ARE POSITIONED AS REQUIRED.	0	0			
B.	JOINT BROUGHT TO THE SNUG-TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION.	0	0	AISC 360,		
С	FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTING			SECTION N5, TABLE N5.6-2	1705.2	SI/TA
	FROM ROTATING.	0	0			
D	FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH THE RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES.	0	0			
INSPE	CTION TASKS AFTER BOLTING:			AISC 360, SECTION N5,	1705.2	SI/TA
A.	DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS.	P	Р	TABLE N5.6-3		
RVE THE	SE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE SE TASKS FOR EACH BOLTED CONNECTION.	INSPECTIONS.				
	VELDING:	1			1	
	CTION TASKS PRIOR TO WELDING:			1		
A	WELDING PROCEDURE SPECIFICATIONS (WPSs) AVAILABLE.	P	Р	1		
В.	MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES	P	Р	1		
	AVAILABLE.	0	0			
D	MATERIAL IDENTIFICATION (TYPE/GRADE). WELDER IDENTIFICATION SYSTEM.	0	0			
E	FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY):	0		AISC 360,		
	JOINT PREPARATION  - DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL).  - CLEAN, BLOSS (CONDITION OF STEEL SURFACES).  - TACKING TRACK WELD QUALITY AND LOCATION).  - BACKING TYPE AND THE WANLIALIES.	0	0	AISC 360, SECTION N5, TABLE N5.4-1	1705.2	SI/TA
F	CONFIGURATION OF FINISH AND ACCESS HOLES.	0	0	1		
G	FIT-UP OF FILLET WELDS: - DIMENSIONS (ALIGNMENT, GAPS AT ROOT) CLEANLINESS (CONDITION OF STEEL SURFACES) TACKING (TACK WELD QUALITY AND LOCATION).	0	0			
н.	CHECK WELDING EQUIPMENT.	0	4	†		
	ECTION TASKS DURING WELDING:			1	1	
A	USE OF QUALIFIED WELDERS.	0	0	1		
В	CONTROL AND HANDLING OF WELDING CONSUMABLES: - PACKAGING.		0	]		
	- PACKAGING. - EXPOSURE CONTROL.	0	<u> </u>	]		
С	NO WELDING OVER CRACKED TACK WELDS.	0	0	1		
D	WBS FOLLOWED: - SETTINGS ON WELDING EQUIPMENT TRAVEL SPEED SELECTED WELDING MATERIALS SHELDING GAS TYPERLOW RATE PREHEAT APPLIED, ATTURE ABANTAMED (MINAMAX) PROCEED POSITION (F, V, H, OH).	o	0	AISC 360, SECTION N5, TABLE N5.4-2	1705.2	SI/TA
E.	WELDING TECHNIQUES:  - INTERPASS AND FINAL CLEANING.  - EACH PASS WITHIN PROFILE LIMITATIONS.  - EACH PASS MEETS QUALITY REQUIREMENTS.	0	0			
INSPE	CTION TASKS AFTER WELDING:					
A.	WELDS CLEANED.	0	0	1		
8.	SIZE, LENGTH AND LOCATION OF WELDS.	Р	P	1	1	
С	WELDS MEET VISUAL ACCEPTANCE CRITERIA: - CRAC'S PONSHTION WELDERSE-WETAL FUSION CRATER FORGS SECTION WELD PROFILES WELD SIZE UNDERCUT PORGSITY.	P	P	AISC 380, SECTION N5, TABLE N5.4-3	1705.2	SVTA
D.	ARC STRIKES.	Р	р			
		P	Р	1		1
E	K-AREA.					
E	BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED).	p	P			

OBSERVE THESE ITEMS ON A RANDOM BASIS, OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS, PERFORM THESE TASKS FOR EACH WELDED JOINT OR MEMBER.

GENERAL STRUCTURAL NOTES

- THE STRUCTURAL NOTES ARE INTENDED TO AUGMENT THE DRAWINGS AND SPECIFICATIONS, SHOULD CONFLICTS EXIST BETWEEN THE DRAWINGS, SPECIFICATIONS AND THE STRUCTURAL NOTES, THE STRUCTUST PROVISION SHALL GOVERN.
- BETWENT HE DRAWNINGS, SPECIFICATIONS AND THE STRUCTURAL MOTES, THE STRUCTURES PROVISION SHALL GOVERN THE STRUCTURAL DRAWNINGS FORM AN INTEGRAL PART OF CONTRACT DOCUMENTS, WINCH HACLUBE ACMORPHISTORIS STRUCTURAL MECHANICAL, ELECTRICAL, CIVILISTIE DRAWNINGS AND SPECIFICATIONS, COORDINATE THE STRUCTURAL DRAWNINGS WITH THE EQUIREMENTS SHOWN IN THE OTHER COMPONENTS OF THE CONTRACT DOCUMENTS. TYPICAL DETAILS AND OTHER SECTIONSOFERIALS APPLY TO COMDITIONS THAT ARE SMILLER AT DITE CONTRICTORS DESCRIBED IN THE SECTIONSIDETIALS, EVEN IF THEY ARE NOT SPECIFICALLY REFERENCED ON THE PLANS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEANS, METHODS, SEQUENCES AND PROCEDURES OF CONSTRUCTION.
- THE CONTROLING SHALL BE RESPONSIBLE FOR MANNA, BILLIOUS, SELECTIVES AND PROJUBLINES OF CONSTRUCTION.

  CONSTRUCTION SHALL COMEY FULLY WITH THE APPLICABLE PROVISIONS OF OSHA AND THE LOCAL GOVERNING COOSE.

  CURRENT EDITION, AND ALL REQUIREMENTS SPECIFIED IN THE CODES SHALL BE ADHERED TO AS IF THEY WERE CALLED

  FOR OR SHOWN ON THE DRAWINGS. THIS SHALL NOT BE CONSTRUCT TO MAEN THAT REQUIREMENTS SET FORTH ON THE

  DRAWING MAY BE MODIFIED BECAUSE THEY ARE MORE STRINGENT THAN THE CODE REQUIREMENTS OR BECAUSE THEY

  ARE NOT SPECIFICALLY REQUIRED BY CODE.
- GOVERNING BUILDING CODE. HIGHEAM BUILDING CODE 2015. STANDARDS LISTED IN STRUCTURAL NOTE SECTIONS REFER TO THE VERSION AND EFFECTIVE DATE IDENTIFIED IN THE REFERENCED STANDARDS CHAPTER IN THE GOVERNING BUILDING CODE.
- WORK CONSTRUCTED PER THESE DRAWINGS SHALL BE INSPECTED BY AN INDEPENDENT TESTING AGENCY RETAINED TO ENSURE COMPLIANCE WITH THE REQUIREMENTS SHOWN ON THE DRAWINGS. SPECIAL INSPECTIONS REQUIRED BY THE GOVERNING BUILDING CODE, LOCAL BUILDING DEPARTMENT AND THE CONTRACT DOLUMENTS SHALL BE REPEORATED BY A QUALIFIED SPECIAL INSPECTOR. PROJECT SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE OR REPLACE INSPECTION.

### SHOP DRAWINGS

- SUBMIT SHOP DRAWINGS FOR REVIEW AS INDICATED IN MATERIAL SECTION OF GENERAL STRUCTURAL NOTES.
- REVIEW OF SHOP DRAWINGS AND OTHER SUBMITTALS BY THE STRUCTURAL ENGINEER DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO CHECK THE SHOP DRAWNINGS PRIOR TO SUBMITTAL ERRORS AND MISSIONS ASSOCIATED WITH THE RESPONSIBILITY TO CHECK THE SHOP DRAWNINGS PRIOR TO SUBMITTAL ERRORS AND MISSIONS ASSOCIATED WITH THE REPREVAINTION OF SHOP DRAWNINGS NOT CONFORMING TO THE CONSTRUCTION DOCUMENTS ARE THE RESPONSIBILITY OF THE SHOP DRAWNING PREPARER.
- CONTRACTOR SHALL PROVIDE A SET OF APPROVED SHOP DRAWINGS BEARING THE REVIEW STAMP OF THE STRUCTURAL
- CONTRACTOR SHALL PROVIDE A SET OF APPROVED SHOP DRAWINGS BEARING THE REVIEW STAMP OF THE STRUCTURAL ENGINEER. TO THE LOCAL BUILDING EPRATIMENT AND TO THE PROJECT SITE.

  CONTRACTOR SHALL VERIFY ALL RELEVANT DIMENSIONS AND ELEVATIONS FOR EQUIPMENT INSTALLATIONS AGAINST PURCHASED MANUFACTURERS CERTIFIED EQUIPMENT GRAWINGS. CONTRACTOR SHALL COORDINATE DIMENSIONS THAT DEPEND UPON SPECIFIC EQUIPMENT, SUCH AS ELEVATOR OPENINGS, MECHANICAL EQUIPMENT SUPPORTS ETC. PROR TO SUBBITITAL SUCH DIMENSIONS SHALL DE PROVIDED ON THE SHOP OP PRAYMINGS PRIOR TO SUBBITITAL TO THE STRUCTURAL ENGINEER. CONTRACTORS FAILURE TO PROVIDE SUCH DIMENSIONS ON SUBMITTED SHOP DRAWINGS WILL DESCRIPT AND STRUCTURAL ENGINEER. RESULT IN SHOP DRAWING RETURN WITHOUT REVIEW

### EXISTING CONSTRUCTION

- CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH THE EXISTING CONDITIONS.
- EXISTING BUILDING DIMENSIONS AND CONDITIONS SHOWN ARE RASED LIPON ORIGINAL DRAWINGS OR PARTIAL SURVEY AND HAVE NOT BEEN COMPLETELY FIELD VERIFIED. THE OWNER AND ARCHITECT/STRUCTURAL ENGINEER TAKE NO RESPONSIBILITY FOR THE ACCURACY OF EXISTING DIMENSIONS SHOWN, CONTRACTOR SHALL FIELD MEASURE EXISTING DIMENSIONS PRIOR TO SHOP DRAWING PREPARATION AND FASRICATION,
- DIMENSIONS PRIOR TO SHOP DRAWNING PREPARATION AND FABRICATION.

  THE ANALYSIS OF THE ENSITING STRUCTURE IS ABSED JUPON INFORMATION SHOWN ON ORIGINAL DRAWINGS BYROBERT M.

  DARVAS ASSOCIATES CONSULTING STRUCTURAL ENGINEERS DATED JUNE 22, 1977

  CONTRACTIOS SHALL VERIFY CONDITIONS COVERING OR AFFECTING THE STRUCTURAL WORK, OBTAIN AND VERIFY ALL

  DIMENSIONS AND ELEVATIONS TO ENSURE THE PROPER STRENGTH, FIT AND LOCATION OF THE STRUCTURAL WORK

  REPORT TO THE ARCHITECTISTRUCTURAL ENGINEER ANY AND ALL CONDITIONS DISCREPANCIES WHICH MAY MITERFERE

  WITH OR OTHERWISE AFFECT OR PREVENT THE PROPER EXECUTION AND COMPLETION OF THE MEW WORK IN

  COMMENION WORK.

  EASTING CONSTRUCTION NOT UNDERGOING AL TERATION IS TO REMAIN JUNDISTURBED. WHERE SUCH CONSTRUCTION IS

  DISTURBED AS A RESULT OF THE OPERATIONS OF THIS CONTRACT, CONTRACTOR SHALL REPAIR OR REPLACE AS

  REQUIRED AND TO THE SATISFACTION OF THE ARCHITECTISTRUCTURAL ENGINEER AND OWNERS REPRESENTATIVE.

  CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION AND TO THE ARCHITECTISTRUCTURAL ENGINEER AND OWNERS REPRESENTATIVE.
- CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION AND ELEVATION OF EXISTING UTILITIES, SEWERS, DRAINS, ETC. IN DEMOLITION AREAS BEFORE PROCEEDING WITH THE WORK, ALL DISCREPANCIES SHALL BE DOCUMENTED AND REPORTED TO THE ARCHITECT/STRUCTURAL ENGINEER AND OWNER'S REPRESENTATIVE FOR RESOLUTION.
- CONTRACTOR SHALL PROVIDE FIRE WATCH DURING FIELD CUTTING AND WELDING OPERATIONS, MEETING THE OWNER'S REQUIREMENTS.
- CONTRACTOR SHALL PROVIDE TEMPORARY PROTECTION OF EXISTING EQUIPMENT DURING EXECUTION OF WORK, SATISFYING THE OWNER'S REQUIREMENTS.
- CONTRACTOR SHALL PROVIDE TEMPORARY PROTECTION TO PREVENT DAMAGE FROM THE WEATHER AND VANDALISM.
- CONTRACTOR SHALL COORDINATE WORK WITH THE OWNER'S PERSONNEL TO AVOID ANY INTERFERENCE IN THEIR OPERATIONS.

- STRUCTURAL STEEL

  BESIGN FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE AMERICAN INSTITUTE
  OF STEEL CONSTRUCTION (AISC) 380 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS AND THE STEEL CONSTRUCTION
  MANUAL, ALLOWABLE STRENGTH DESIGN ASD.
- 2 STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS AND MINIMUM YIELD STRENGTH: MISCELLANEOUS SHAPES AND PLATES A36 Fy = 36 KSI
- STRUCTURAL STEEL BOLTING SHALL BE ASTM A325 TYPE N, 3/4" DIAMETER SNUG TIGHT EXCEPT WHERE OTHER SIZE, ASTM A490 N, PRE-TENSIONED OR SLIP-CRITICAL TYPE BOLTS ARE INDICATED.
- WELDING SHALL BE DONE WITH APPROPRIATE ETD SERIES ELECTRODES COMPATIBLE WITH THE NEW AND EXISTING STEEL WELDS AND WELDING PROCEDURES SHALL CONFORM 10 AND WELDERS HALL BE QUALIFIED IN ACCORDANCE WITH, THE STRUCTURAL WELDING CODE STEEL OF THE AMERICAN WELDING SOCIETY, ANSIANDS 11.
- DETAILING SHALL BE PERFORMED USING RATIONAL ENGINEERING DESIGN AND STANDARD PRACTICE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE TYPICAL DETAILS SHOWN ARE APPROXIMATE ONLY AND DO NOT INDICATE THE REQUIRED NUMBER OF BOLTS OF WELD SIZES, UNLESS SPECIFICALLY NOTED.
- CONTRACTOR SHALL SUBMIT FOR REVIEW, ENGINEERS DRAWINGS SHOWING SHOP FABRICATION DETAILS, FIELD ASSEMBLY DETAILS AND ERECTION DIAGRAMS FOR ALL STRUCTURAL STEEL. SHOW AT MINIMUM ALL DETAILS INCLE THESE CONTRACT DOCUMENTS WITH ADDITIONAL ERECTION DETAILS AS REQUIRED TO COMPLETELY DEFINE THE MYERCONNECTION OF STRUCTURAL STEEL NECES.
- INTERCONNECTION OF STRUCTURAL STELL PIECES.

  THE LEIGHT, INMERISION AND CONNECTION DETAIL FROM NEW STRUCTURAL MEMBER TO EXISTING STRUCTURES SHALL BE FIELD VERRIED BEFORE FABRICATION, FIELD MODIFICATIONS TO THE FABRICATED MEMBER OR CONNECTION ARE NOT ALLOWED WITHOUT PRIOR APPROVAL BY THE STRUCTURAL ENSINEER, CONTRACTOR SHALL SUBMIT SKETCHES OR SHOP DRAWNINGS DETAILING PROPOSED MODIFICATIONS FOR APPROVAL.

  CONNECTIONS SHALL BE SHOP WELDED IN ACCORDANCE WITH LATEST AWS SPECIFICATIONS FOR E7XXX ELECTRODES AND FIELD BOLTED WITH ASTIM A25 OR ASTIM A69 BOLTS.
- CONTRACTOR SHALL INSTALL A325 BOLTS IN ACCORDANCE WITH THE "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 BOLTS," SUBJUTIENT CONNECTED PULSS INTO FIRM CONTACT, EXCEPT WHERE NOTED AS SUP-CRITICAL, RF. TENSORIOE OR PRIORET RICHORD.
- PRIES INFO FINA CONTROL, EACH TWENCE NO LED AS SOUR-CHILDAD, PRE-TENDRUCED OF PINGER TIGHT.

  WHERE FIELD WELDING TO EXISTING STRUCTURAL STEEL IS INDICATED, CONTRACTOR SHALL THOROUGHLY CLEAN ALL SURFACES TO RECEIVE WELD, REMOVING RUST, PAINT, DIRT AND OTHER FOREIGN MATTER IN AREA OF WORK, PROVIDE FIRE WATCH PROTECTION ACCEPTABLE TO THE OWNER.
- STRUCTURAL STEEL TO REMAIN UNPAINTED EXCEPT FOR STEEL OUTSIDE THE 'CONDITIONED SPACE',
- SHOP AND FIELD TESTING OF WELDS AND/OR BOLTS SHALL BE AS FOLLOWS:

  a ALL WELDS SHALL BE VISUALLY INSPECTED; 15% AT RANDOM SHALL BE MEASURED.
- VISUALLY INSPECT THAT ALL BOLTED CONNECTIONS ARE MADE WITH PROPER FASTENER COMPONENTS, ARE FABRICATED PROPERLY AND THE BOLTED JOINT IS DRAWN INTO FIRM CONTACT.
- WELDING SHALL BE INSPECTED BY AN AWS CERTIFIED WELDING INSPECTOR (CWI).
- 14. CONTRACTOR SHALL SCHEDULE WORK TO ALLOW THE ABOVE TESTING REQUIREMENTS TO BE COMPLETED.

# **DiClemente** Siegel Design

Inc.

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CITY OF ANN ARBOR FIRE STATION #1 **GENERATOR** ANN ARBOR, MICHIGAN

**GENERAL** STRUCTURAL NOTES AND SPECIAL INSPECTION SCHEDULES

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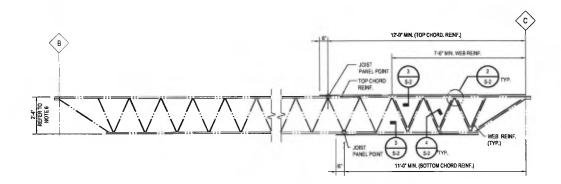
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DESIGNER: JG DRAWN: SG PM / PIC: JSRBJR CHECKED: TN ACADFILE: 17-1241 S-1 CONSULTING ENGINEERS 6765 DALY ROAD WEST BLOOMFIELD, MI 48322 T/ (248) 932.2010 F/ (248) 932.3088 PROJECT No. S-1

# STATEMENT OF SPECIAL INSPECTIONS

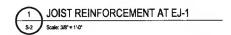
DESIGNATIONS:

- SI SPECIAL INSPECTOR QUALIFIED WITH DEMONSTRATED COMPETENCE DOCUMENTED BY CERTIFICATIONS FROM RECOGNIZED AGENCIES SUCH AS ANS, ACI, MASONRY INSTITUTE OF MICHIGAN (NIM), ETC.
  AS SUBMITTED AND APPROVED BY THE BUILDING OFFICIAL. SPECIAL INSPECTOR MAY BE A FIRM WITH MULTIPLE SPECIALISTS AND A PROJECT MANAGER PROVIDING REPORTS.
- TA TESTING AGENCY QUALIFIED TO TEST AND INSPECT MATERIALS AND ASSEMBLIES. TESTING AGENCY SHALL BE UNDER THE SUPERVISION OF THE SPECIAL INSPECTOR.
- GE GEOTECHNICAL ENGINEER WHO PROVIDED THE ORIGINAL PROJECT GEOTECHNICAL SOILS INVESTIGATION REPORT.
- SE SPECIALTY ENGINEER RESPONSIBLE FOR DESIGNING ASSEMBLIES SUCH AS PRECAST CONCRETE, STEEL JOISTS, COLD FORWED FRAMING ASSEMBLIES, ETC. SPECIALTY ENGINEER SHALL PROVIDE OBSERVATION OF FABRICATED AND INSTALLED ITEMS OF THEIR DESIGN IN ADDITION TO THE SPECIAL INSPECTION.
- TA, GE AND SE SHALL SUBMIT RECORDS OF THE INSPECTION RESULTS TO THE SI. THE SI SHALL COMPILE AND SUBMIT INSPECTION RECORDS TO THE ARCHITECTENGINEER AND BUILDING OFFICIAL, RECORDS SHALL INCLUDE STATEMENTS OF TESTS, WHETHER INSTALLED FABRICATED ITEM COMPILES WITH CONTRACT DOCUMENTS, REDEDIAL WORK PERFORMED, RETESTS.
- SI SHALL PROVIDE A DAILY REPORT OF ANY DISCREPANCIES FROM THE CONTRACT DOCUMENTS FOUND ON THE SAME DAY OF THE INSPECTION TO THE ENGINEER OF RECORD, FORMAL REPORTS OF COMPLIANCE CAN FOLLOW BY A MAXIMUM OF 2 WEEKS, SI SHALL PROVIDE AND SIGN FINAL REPORT WITH A SUMMARY OF ALL TESTS PERFORMED AND RESULTS TO THE ENGINEER OF RECORD AND BUILDING OFFICIAL, IN ACCORDANCE WITH SECTION 1704.24.
- SI, TA & GE SHALL BE PAID BY THE OWNER IN COMPLIANCE WITH THE MICHIGAN (INTERNATIONAL) BUILDING CODE.
- WHERE FARRICATION OF STRUCTURAL, LOAD-BEARING OR LATERAL LOAD-RESISTING MEMBERS OR ASSEMBLIES IS BEING CONDUCTED ON THE PREMISES OF A FABRICATION'S SHOP, SPECIAL INSPECTIONS OF THE FARRICATION OF STRUCTURES SHALL BE PERFORMED DURING FABRICATION. SPECIAL INSPECTIONS DURING FABRICATION OF THE PREMISES OF A FABRICATION AND ADMINISTRATION OF THE WORK OF THE PREMISE OF
- REFER TO SPECIAL INSPECTION SCHEDULES AND GENERAL STRUCTURAL NOTES FOR ADDITIONAL QUALITY CONTROL TESTING AND INSPECTIONS.

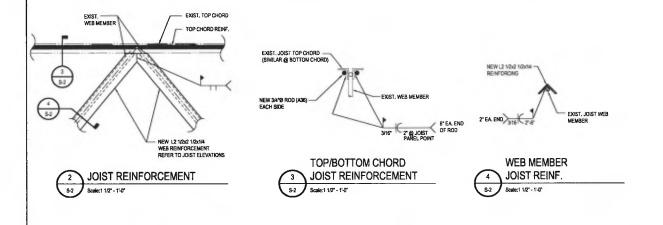


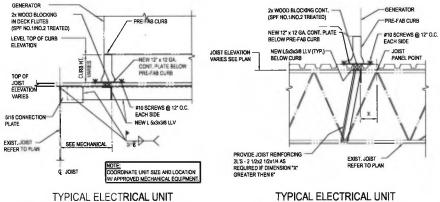
### NOTES:

- 1 CONTRACTOR TO VERIFY IN FIELD ALL EXISTING DIMENSIONS .
- 2 CONTRACTOR TO FIELD VERIFY EXISTING JOIST CONFIGURATION, FIELD MEASURE JOIST PANEL POINTS AND MEMBER SIZES.
- 3 PROVIDE TEMPORARY SHORING AND BRACING FOR EXISTING JOISTS BEFORE AND DURING OPERATIONS AND UNTIL THE WORK IS SAFELY COMPLETED.
- 4. CONTRACTOR SHALL USE CARE DURING WELDING TO INSU



- 5 PROVIDE FIRE WATCH & FIRE PROTECTION DURING WELDING OPERATIONS.
- EJ-1: EXISTING JOIST 28H8 TO BE REINFORCED
- 7. THE CUT OFF LENGTH FOR TOP CHORD, BOTTOM CHORD AND WEB REINFORCEMENT ARE MEASURED FROM SUPPORT CENTER LINE TO NEAREST JOIST PANEL POINT.
- 3 CONTRACTOR TO REMOVE AND RE-INSTALL CEILING AS REQUIRED TO PROVIDE ACCESS TO STRUCTURAL STEEL.

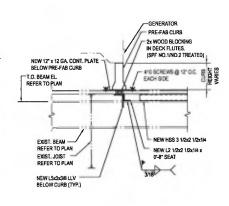




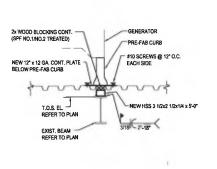
PRE-FAB CURB @ JOIST

Scale: 3/4" = 1'-0"

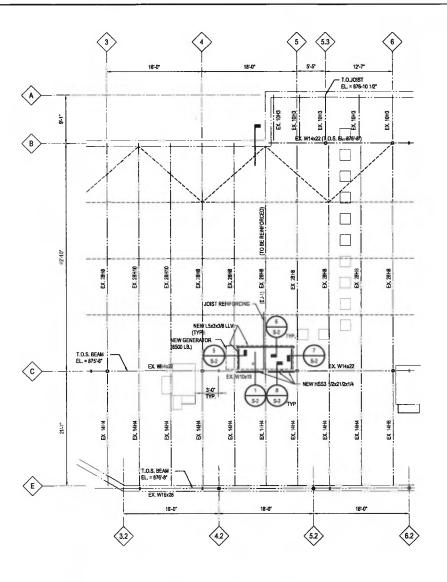
TYPICAL ELECTRICAL UNIT
PRE-FAB CURB @ JOIST
Scale: 34" = 1-0"

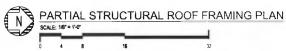


TYPICAL ELECTRICAL UNIT
PRE-FAB CURB @ BEAM
Scale: 34\* = 1-07



8 SECTION Scale: 3/4" = 1'-0"





# NOTES: 1, TOP OF EXISTING STEEL EL. - REFER TO PLAN

- VERIFY IN FIELD ALL EXISTING DIMENSIONS AND ELEVATIONS
- 3 REFER TO DWG, S-1 FOR GENERAL STRUCTURAL NOTES AND SPECIAL INSPECTION SCHEDULES



CITY OF ANN ARBOR
FIRE STATION #1
GENERATOR
ANN ARBOR, MICHIGAN

PARTIAL ROOF FRAMING PLAN AND DETAILS

These documents are instruments of services for use solely with respect to this project. DOS and DSSTs consultants with the deement the survivors and owners of their appeache instruments of sciences are stall visible all common the studiory and other reservoir dysts instruments and sciences are stall visible all common their studiory and other reservoir dysts. Parking pumpiglies. DSSI grains to the owner a nonexcludive license to exprosious DSSI struments of a revisible fictions to reproduce DSSI struments of a revisible fictions or reproduced DSSI struments of a revisible solely for the outprocess of constructing, using and methaling this project.

These documents are traditional plan and specifical Cocuments that are <u>not</u> intended to be used by contractor as shop drawings. Fixed dimensions, equipm access, morifing miscellaneous fillings, final installation confidentials in the nontractive responsible.

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	DESIGNER:	JG
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	CHECKED:	TN
CONSULTING ENGINEERS	ACADFILE:	17-1241 S2
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### I. GENERAL

- A PROVIDE MATERIALS AND EQUIPMENT AND EXECUTE THE WORK, INCLUDING ALL TESTING AND INSPECTIONS, IN COMPILANCE WITH THE APPLICABILITY EXPOSED OF FEBERAL STRUCTURE AND LOCAL GESTING AND INFOSCIONAS, IN COMPILANCE WITH THE APPLICABILITY EXPONSIONS OF FEBERAL STRUCTURE AND LOCAL GOVERNMENT LAWS, ORDINANCES, REFERENCED CODES AND STANDARDS CURRENT AS OF THE SISSE DATE OF THESE DRAWINGS INCLUDING THE GOVERNING LAWS, ORDINANCES, CODES AND STANDARDS CONSTITUTE MINIMAM REQUIREMENTS, ALL MORE STRINGENT REQUIREMENTS OF THE CONTRACT DOCUMENT SHALL WORK OF SUPERIOR AND SUPERISEDE APPLICABLE PORTIONS OF GOVERNING LAWS, GODINANCES, CODES AND STANDARDS.
- B. CONTRACTOR SHALL PRESENT CERTIFICATE TO THE OWNER THAT ALL APPLICABLE BUILDING PERMITS HAVE BEEN COMMINICATION SMALL PRESENT CENTIFICATE TO THE UNIVER THAT JULL PAPELL-OLDE DISLIGATOR FROM TO MAKE SEEN SECURICE PRIOR TO STARTING ANY WORK, AND PROVIDE THE OWNER THAT ALL REQUIRED CENTIFICATES OF FINAL APPROVAL FROM THE COVERNING JURISDICTIONS AT COMPLETION OF THE WORK. PROVIDE ALL SHOP DRAWINGS AS REQUIRED IN FOLLOWING SECTION.
- C, MAKE ALL CONNECTIONS TO EXISTING SYSTEMS DURING DESIGNATED PERIODS UPON APPROVAL OF THE OWNER AND AT
- D. COORDINATE EXACT LOCATION OF CONSTRUCTION TO PRECLUDE ANY INTERFERENCES BETWEEN PIPING, WIRING, LIGHTING FIXTURES, DUCTWORK, BUILDING EQUIPMENT, PROCESS EQUIPMENT AND OTHER CONSTRUCTION.
- E PROVIDE ALL LABOR INCLUDING FIELD ERECTION AND SUPERVISION, TOOLS, MATERIALS, EQUIPMENT AND ANCILLARIES AND COORDINATE, PROCURE, FABRICATE, DELIVER, ERECT OR INSTALL, INTERFACE WITH EXISTING WORK, START, DEBUG AND TEST ALL SYSTEMS AS NECESSARY TO PROVIDE THE OWNER WITH A COMPLETE, OPERATING FACILITY IN ICE WITH THE CONTRACT DOCUMENTS
- F. ALL CUTTING AND PATCHING THAT MAY BE NECESSARY FOR THE INSTALLATION OF THE WORK SHALL BE PERFORMED AND REPAIRED BY THE TRADE WHO NORMALLY PERFORMS THAT WORK AND SHALL BE PAID FOR BY THE CONTRACTOR. NO CUTTING OF THE BUILDING STRUCTURAL SYSTEM SHALL BE PERFORMED WITHOUT THE PRIOR WRITTEN CONSENT OF THE REPAIRED.
- G. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING HIS BID TO FAMILIARIZE HIMSELF WITH THE ACTUAL THE CONTRACTOR SHALL WIST THE SITE PRIOR TO SUBMITTING HIS BID TO FAMILARIZE HIMSELF WITH THE ACTUAL PROJECT COMDITIONS AND TO CHECK FOR ANY INTERFERENCES BETWEEN HIS WORK AND THAT OF THE OTHER TRADES, ANDORA MAY APPARENT WIOLATIONS OF LOCAL OR STATE CODDS, LAWS, ORDINANCES AND REQULATIONS, SHOULD MAY WOLATIONS OR INTERFERENCES APPEAR AND DEPARTURE FROM THE DESIGN INTERN OF THE CONTRACT DOCUMENTS IS REQUIRED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO ENTERNING INTO A CONTRACT WITH THE OWNER, FALLIES TO PROVIDE THE ENGINEER WITH THE APOREMENTIONED MOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE INTERN TO FHE CONTRACT OR DOCUMENTS WITH NO ADDITIONAL EXPENSES BEING INCURRED BY THE OWNER.

NO APPARATUS OR EQUIPMENT SHALL BE SHIPPED FROM STOCK OR FABRICATED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND STAMPED THO EXCEPTIONS OR REVSIONS NOTED

SUBMIT FOR APPROVAL, SHOP DRAWINGS FOR ALL EQUIPMENT, MATERIALS, VALVES, PLUMBING AND HEATING SPECIALTIES, PIPE HANGERS, WIRING DIAGRAMS AND CONTROL DIAGRAMS INCLUDING, BUT NOT LIMITED TO THE ITEMS LISTED BELOW, WHERE TIENS ARE REFERRED TO BY SYMBOL NUMBERS ON THE DRAWINGS AND SPECIFICATIONS, ALL SUBMITTALS SHALL BEAT THE SAME SYMBOL NUMBERS, ALL DRAWINGS SHALL DOWTANT THE PROJECT NUMBER, NO LOOS SHEETS SHALL BE SUBMITTED LINLESS A COVER SHEET OF TRANSMITTAL IS ATTACHED.

PROVIDE THE FOLLOWING SHOP DRAWINGS:

### NATURAL GAS PIPING VALVES AND REGULATORS

APPROVAL OF SHOP DRAWINGS DOES NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITIES TO CONFORM TO THE DESIGN INTENT OF THE CONTRACT DOCUMENTS, APPROVAL OF SHOP DRAWINGS IS INTENDED TO BE FOR GENERAL CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS ONLY, ANY PISTALLE DEQUIPMENT WHICH REQUIRES WORK BY OTHER TRADES, SHALL BE CONDINATED WITH THOSE TRADES. REFER TO OTHER TRADES BID DOCUMENTS.

UNLESS OTHERWISE INDICATED, ALL REQUIRED PERMITS, LICENSES, INSPECTIONS, APPROVALS AND FEES FOR THE WORK HALL BE SECURED AND PAID FOR BY THE CONTRACTOR, ALL WORK SHALL CONFORM TO ALL APPLICABLE CODES, RULES

RULES OF LOCAL LITILITY COMPANIES SHALL BE COMPLIED WITH. BEFORE SUBMITTING HIS BID, THE CONTRACTOR SHALL VERIETY WITH EACH UTILITY COMPANY SUPPLYING SERVICE TO THIS PROJECT, THAT ALL VALVES, METER BOXES AND METERS REQUIRED WILL BE PROVIDED, THE CONTRACTOR SHALL INCLUDE THE COST IN HIS BID, (NO ADDITIONAL PAYMENTS WILL BE MADE FOR INSTALLATION OF SUCH THEMS, EXCEPT IN CASES WHERE THE REQUIREMENTS OF THE UTILITIES COMPANIES MAY CHANGE AFTER THE BID HAS BEEN SUBMITTED).

ALL WORK SHALL RE EXECUTED IN ACCORDANCE WITH THE RULES AND REGULATIONS SET FORTH IN LOCAL AND STATE ALL WORK SHALL BE DECLIFED IN AUCCUSIONANCE WITH THE ROLLES MOD REGULATIONS SET VALCE IN COOLING OF THE COOLING

MATURAL CAS PIPING
MATURAL CAS PIPING 2' AND LARGER SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH WELDED JOINTS AND STANDARD
WEIGHT BUTT WELDED FITTINGS.
MATURAL GAS PIPING 2' AND SMALLER SHALL BE SAME AS ABOVE, EXCEPT WITH 150 LB. MI THREADED FITTINGS MADE UP
WITH TETLON BASED PIPE THREAD COMPOUND.

# C. PIPE HANGERS AND SUPPORTS

THE MECHANICAL CONTRACTOR SHALL PROVIDE PIPE HANGERS AND SUPPORTS AS REQUIRED. PROVED MANUFACTURERS SHALL BE: GRINNELL, CARPENTER-PATTERSON, FEE-MASON OR MICHIGAN HANGER CO.

GENERALLY ALL SUPPORT COMPONENTS SHALL CONFORM TO MANUFACTURERS' STANDARDIZATION SOCIETY

HANGERS SHALL ADEQUATELY SUPPORT THE PIPING SYSTEM, THEY SHALL BE LOCATED NEAR OR AT CHANGES IN PIPING DIRECTION, WITHIN 1-Y-OF EVERY FITTING AND CONCENTRATED LOAD, THEY SHALL RROUDE VERTICAL ADJUSTMENT TO MAINTAIN PITCH REQUIRED FOR PROPER DRAINAGE, ANDOR VENTING. THEY SHALL ALLOW FOR EXPANSION AND CONTRACTION OF THE PIPING, HANGERS SHALL BE FASTENED TO BUILDING STRUCTURAL MEMBERS WHEREVER PRACTICAL AND HUNG FROM TRUSS OR JOIST PANEL POINTS ONLY.

THREADED JOINTS SHALL HAVE AMERICAN NATIONAL STANDARD TAPER PIPE THREADS, REAM PIPE ENDS AND REMOVE BURRS AFTER THREADING, MAKE UP JOINTS USING AN APPROVED COMPOUND APPLIED TO THE MALE THREADS ONLY

SOLDER JOINTS: TUBING OR PIPE SHALL BE CUT SQUARE AND BURRS REMOVED. BOTH INSIDE OF FITTINGS AND OUTSIDE OF TUBING OR PIPE SHALL BE WELL CLEANED WITH STEEL WOOL BEFORE SWEATING, CARE SHALL BE TAKEN TO PREVENT ANNEALING OF FITTINGS AND HARD DRAWN TUBING WHEN MAKING CONNECTIONS, JOINTS SHALL BE MADE WITH 95/5

SURFACE OF ALL PARTS TO BE WELDED SHALL BE THOROUGHLY CLEANED AND SHALL BE FREE FROM ALL PAINT, OIL, RUST

FLANGES SHALL BE WELDED TO PIPE BY MEANS OF WELDING NECK FLANGES, BLIND FLANGES SHALL SE MADE WITH WELDING NECK FLANGES AND BLIND FLANGES, CAPS ON SMALLER LINES SHALL BE SCREWED ON FOR EASY REMOVAL

WELDING SHALL BE OONE IN ACCORDANCE WITH THE WELDING PROCEDURES OF THE NATIONAL CERTIFIED PIPE WELDING BUREAU OR OTHER APPROVED PROCEDURE CONFORMING TO THE REQUIREMENTS OF THE A.S.M.E. BOILER AND PRESSURE VESSEL COOP OR THE A.S.A.COOP FOR THE PRESSURE PURING. NO WELDER SHALL BE EMPLOYED ON THE

WORK WHO HAS NOT FULLY QUALIFIED UNDER THE ABOVE SPECIFIED PROCEDURE AND SO CERTIFIED BY A MEMBER OF A LOCAL CHAPTER OF THE NATIONAL CERTIFIED PIPE WELDING BUREAU OR SIMILAR LOCALLY RECOGNIZED YESTING

ALL FITTINGS SHALL BE SEAMLESS STEEL WELDED TYPE OF WEIGHT REQUIRED FOR THE SERVICE OR AS HEREIN

BRANCH TAKE-OFFS SHALL BE MADE WITH FACTORY MADE STRAIGHT OR REDUCING TEES, OR WELDOLETS OF BUTI SOCKET OR THREADED TYPE SIMILAR TO THOSE MANUFACTURED BY BONNEY FORGE, WELDOLETS SHALL PROVIDE PIPE STRENGTH FOR ALL SIZES, WEIGHTS AND SCHEDULES.

INTERING, NOTCHING OR DIRECT WELDING OF PIPE TO THE MAIN TO FORM TEES AND ELBOWS OR OTHER SIMILAR TYPE CONSTRUCTION WILL NOT BE PERMITTED.

VALVES AND EQUIPMENT SHALL NOT BE WELDED INTO THE PIPING SYSTEM, SCREWED TYPE UNIONS OR COMPANION FLANGES SHALL BE USED TO ALLOW FOR REMOVAL WITHOUT CUTTING OF PIPE.

PROVIDE A FIRE RESISTANT MAT OR BLANKET TO PROTECT THE STRUCTURE AND ADEQUATE FIRE PROTECTION EQUIPMENT AT ALL LOCATIONS WHERE WELDING IS DONE.

PING AND CONDUIT SHALL BE LOCATED OR OFFSET AS REQUIRED TO CLEAR OTHER TRADES WORK, TO AVOID TERFERENCE WITH OTHER PIPING HAVING PRECEDENCE. TO CONCEAL THEM MORE READLY OR TO ALLOW FOR SUMUM HEADNOWN PIPING AND COMOUNT IN FINISHED AREAS SHALL BE CONCEALED (WHEREVER POSSIBLE).

ALL CUT ENDS SHALL HAVE BURRS REMOVED AND ENDS REAMED.

INTERIOR OF ALL SERVICE PIPING SUCH AS WATER, AIR, ETC. SHALL BE CLEANED FREE OF DIRT AND IMPURITIES BEFORE PIPES ARE PUT IN PLACE, PIPING SHALL BE FLUSHED CLEAN AT COMPLETION

NO PIPING SHALL BE RUIN ABOVE ANY ELECTRICAL DEVICE, PANEL, SWITCHGEAR, ETC, PIPING SHALL BE OFFSET TO CONFORM TO THIS REQUIREMENT WHETHER INDICATED ON THE DRAWINGS OR NOT.

ALL PIPING SHALL BE PROPERLY PITCHED FOR DRAINING AND VENTING AS REQUIRED.

CAP ALL OPENINGS WITH SUITABLE PLUGS OR CAPS DURING CONSTRUCTION.

KEEP HOT AND COLD LINES AT LEAST SIX (6) INCHES APART

EACH TRADE IS WARNED TO MAKE CERTAIN THAT ALL PIPING, FITTINGS, VALVES, THREADS AND JOINTS ARE FREE FROM DEFECTS AND ARE TIGHTLY FITTED, WHERE LEAKS OCCUR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING DEFECTIVE PORTIONS OF THE SYSTEM, AS WELL AS REPAIRING DAMAGES TO FINISH PORTIONS OF THE BUILDING OR ITS CONTENTS AT NO EXTRA COST.

PERFORM ALL TESTS REQUIRED BY STATE, CITY, COUNTY AND/OR OTHER AGENCIES HAVING JURISDICTION, AND AS

PROVIDE ALL MATERIALS, EQUIPMENT, WATER, COMPRESSED AIR, ETC., AND LABOR REQUIRED FOR THE TESTS.

PIPING UNDER HYDROSTATIC PRESSURE TEST SHALL NOT LOSE MORE THAN 2 PSI FOR A PERIOD OF 5 HOURS UNDER TEST PRESSURE. EXAMINE PIPING FOR LEAKAGE.

PIPING UNDER AIR PRESSURE TEST SHALL NOT LOSE MORE THAN 2% OF TEST PRESSURE FOR A PERIOD OF 1 HOUR, TEST SHALL BE PERFORMED WITH AMBIENT TEMPERATURE APPROXIMATELY CONSTANT, TESTS SHALL BE AS REQUIRED BY AGENCIES HAVING JURISDICTION.

VALVES, NPS 2 AND SMALLER: THREADED ENDS ACCORDING TO ASME B1.20.1 FOR PIPE THREADS.

VALVES, NPS 2-1/2 AND LARGER: FLANGED ENDS ACCORDING TO ASME 916.5 FOR STEEL FLANGES AND ACCORDING TO ASME 916.24 FOR COPPER AND COPPER-ALLDY FLANGES.

GAS STOPS. BRONZE BODY WITH AGA STAMP, PLUG TYPE WITH BRONZE PLUG AND FLAT OR SQUARE HEAD, BALL TYPE WITH CHROME-PLATED BRASS BALL AND LEVER HANDLE, OR BUTTERFLY VALVE WITH STAINLESS-STEEL DISC AND FLUOROCARBON ELASTOMER SEAL AND LEVER HANDLE; 2-PSIG MINIMUM PRESSURE RATING.

GAS VALVES INPS 2 AND SMALLER: ASME B16:33 AND IASH ISTED BROWF BODY AND 125-PSIG PRESSURE RATING

PLUG VALVES, NPS 2-1/Z AND LARGER: ASME B16.38 AND MSS SP-78 CAST-IRON, LUBRICATED PLUG VALVES, WITH 125-PSIG DRESS LIDE PATING.

GENERAL-DUTY VALVES, NPS 2-1/2 AND LARGER: ASME B16.38, CAST-IRON BODY, SUITABLE FOR FUEL GAS SERVICE, WITH "WOG" INDICATED ON VALVE BODY, AND 125-PSIG PRESSURE RATING.

- 1. GATE VALVES: MSS SP-70, OS&Y TYPE WITH SOLID WEDGE.
- 2 BUTTERFLY VALVES. MSS SP-67, LUG TYPE WITH LEVER HANDLE.

### H. PRESSURE REGULATORS

DESCRIPTION: SINGLE STAGE AND SUITABLE FOR FUEL GAS SERVICE. INCLUDE STEEL JACKET AND

- 1. NPS 2 AND SMALLER: THREADED ENDS ACCORDING TO ASME B1.20.1 FOR PIPE THREADS.
- 2. NPS 2-1/2 AND LARGER: FLANGED ENDS ACCORDING TO ASME B16.5 FOR STEEL FLANGES AND ACCORDING TO
- 3 SERVICE PRESSURE REGULATORS: ANSI ZZ1.80. INCLUDE 100-PSIG- MINIMUM INLET PRESSURE RATING
- 4 LINE PRESSURE REGULATORS: ANSI ZZ1.80 WITH 2 PSIG MINIMUM INLET PRESSURE RATING.
- 5 LINE PRESSURE REGULATORS: ANSI 221.80 WITH 10-PSIG (68.9-KPA) INLET PRESSURE RATING, UNLESS OTHERWISE

# LABELING AND IDENTIFYING

EQUIPMENT NAMEPLATES AND SIGNS: INSTALL ENGRAVED PLASTIC-LAMINATE EQUIPMENT NAMEPLATE OR SIGN ON OR NEAR EACH SERVICE METER, PRESSURE REGULATOR, AND SPECIALTY VALVE.

TEXT: IN ADDITION TO NAME OF IDENTIFIED UNIT, DISTINGUISH BETWEEN MULTIPLE UNITS, INFORM OPERATOR OF OPERATIONAL REQUIREMENTS, INDICATE SAFETY AND EMERGENCY PRECAUTIONS, AND WARN OF HAZARDS AND IMPROPER OPERATIONS.

PAINT EXTERIOR SERVICE METERS, PRESSURE REGULATORS, AND SPECIALTY VALVES.

1. COLOR: GRAY.

PAINT INTERIOR PIPING, PIPING RUN EXPOSED ON ROOF AND ASOCIATED FITTINGS 1. COLOR. YELLOW.

	SYMBOL LEGEND	
SCHEMATIC SYMBOLS	DESCRIPTION	_
	EXISTING TO REMAIN	
444444.	EXCAVATION REQUIRED	
	NEW WORK	
•	NEW CONNECTION TO EXSITING	
	PIPING ELBOW	
	PIPING ELBOW UP	
—	PIPING ELBOW DOWN	
	PIPING TEE	
	PIPING TEE UP	
	PIPING TEE DOWN	Т
— <b>(X</b> )—	GATE VALVE	
—-ā—	8ALL VALVE	
61	SHUT-OFF VALVE RATED FOR USE WITH NATURAL GAS	_

	PIPING LEGEND
SYMBOL	DESCRIPTION
NG	NATURAL GAS

	MECHANICAL SHEET INDEX
24007	DESCRIPTION
M-1	MECHANICAL GENERAL INFORMATION AND SPECIFICATIONS
N-2	PARTIAL FLOOR PLANS - MECHANICAL
N-3	PARTIAL FLOOR PLANS - MECHANICAL
M-4	MECHANICAL DETAILS

### OVERVIEW OF MECHANICAL SCOPE

THIS OVERVIEW OF SCOPE IS INCLUDED TO GIVE THE CONTRACTOR A GENERAL OVERVIEW OF THE PROJECT REDUIREMENTS. THE OVERVIEW IS NOT ALL INCLUSIVE AND IS NOT INTENDED TO, AND SHOULD NOT BE USED TO, ESTABLISH CONTRACT LIMITS OR PRICING INCLUSIONS. THE CONTRACT OCCUMENTS SHALL BE USED TO ESTABLISH CONSTRUCTION CONTRACT SCOPE.

THIS OVERVIEW OF SCOPE INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

MECHANICAL

CONTRACTOR TO COORDINATE WITH LOCAL MUNICIPALITY AND LOCAL UTILITY COMPANY FOR ON DRAWINGS.

EXTEND NATURAL GAS SERVICE PIPING FROM MODIFIED NATURAL GAS SERVICE METER TO NEW NATURAL GAS GENERATOR.

PROVIDE NATURAL GAS PIPING, FITTINGS, HANGERS AND SUPPORTS.

PROVIDE ALL NECESSARY PERMITS, ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE OWNER'S STANDARDS, STATE AND LOCAL CODES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING CODES AND THEIR RELATED REFERENCES.

2015 MICHIGAN MECHANICAL CODE

2015 MICHIGAN PLUMBING CODE

2015 INTERNATIONAL FIRE CODE (AS REFERENCED)

2015 INTERNATIONAL FUEL GAS CODE NFPA 101 LIFE SAFETY CODE 1997 AND 2006 (AS REFERENCED)

MICHIGAN ENERGY CODE-ASHRAE 90.1-2013

2014 NATIONAL ELECTRICAL CODE AS AMENDED BY THE 2014 MICHIGAN ELECTRICAL CODE RULES, PART 8,

2015 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS

MANUFACTURER AND MODEL NUMBER LISTED REPRESENTS THE BASIS OF DESIGN FOR THIS PROJECT, THE MECHANICAL CONTRACTOR SHALL BEAR ALL ADDITIONAL COST ASSOCIATED WITH USING EQUIPMENT BY OTHER APPROVED MANUFACTURERS INCLUDING ADDITIONAL COSTS BY OTHER TRACES.

ALL EQUIPMENT INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS WHERE FIELD OR PROJECT CONDITIONS DO NOT ALLOW ALL MANUFACTURERS RECOMMENDATIONS TO BE MET, THE INSTALLING CONTRACTOR SHALL SUBMIT IN WRITING TO THE ENGINEER THE PROPOSED DEVIATION, IN A SKETCH FORM, ACCOMPANIED BY THE MANUFACTURER'S

### GENERAL MECHANICAL NOTES:

- 1. COORDINATE SHUT-DOWN OF ANY EXISTING SYSTEMS WITH THE BUILDING SERVICES PERSONNEL.
- COORDINATE NEW PIPING WITH EXISTING SITE CONDITIONS, EQUIPMENT MANUFACTURER'S AND ALL OTHER TRADES TO AVOID INTERFERENCES.
- 3 DRAWINGS ARE DIAGRAMMATIC. THE MECHANICAL WORK SHALL BE FIELD VERIFIED BEFORE PROCEEDING, AND THE WORK SHALL BE COORDINATED PER THIS VERIFICATION.



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Email: mldg@dsdonine.co www.dsdonine.co

Engineering and Architectu

CITY OF ANN ARBOR FIRE STATION #1 **GENERATOR** ANN ARBOR, MICHIGAN

> **MECHANICAL** GENERAL INFORMATION AND **SPECIFICATIONS**

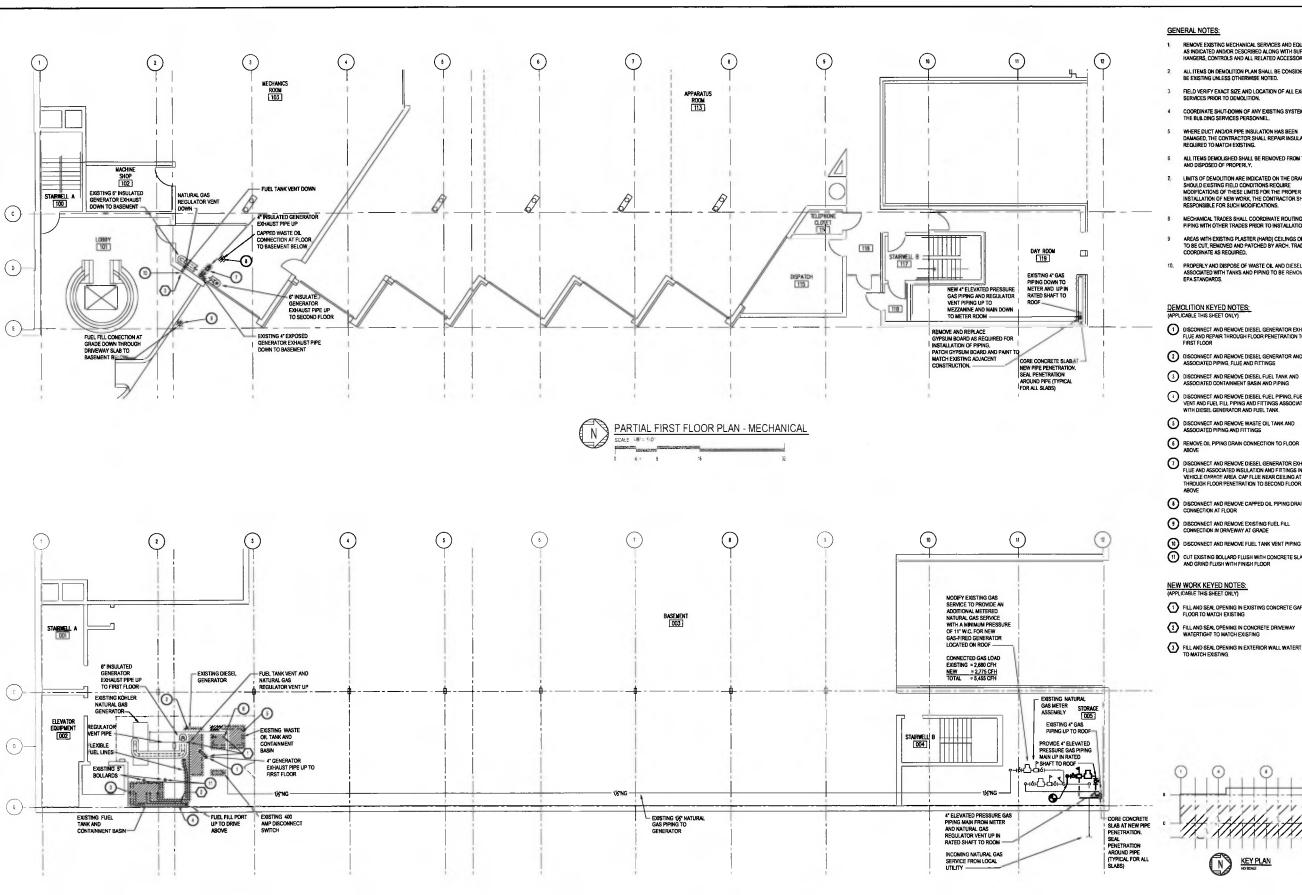
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CHECKED	DCM
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PROJECT No.	17-1304



PARTIAL BASEMENT PLAN - MECHANICAL

SCALE 1/8" = 1'-0"



- REMOVE EXISTING MECHANICAL SERVICES AND EQUIPMEN AS INDICATED AND/OR DESCRIBED ALONG WITH SUPPORTS HANGERS, CONTROLS AND ALL RELATED ACCESSORIES.
- ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED TO BE EXISTING UNLESS OTHERWISE NOTED.
- FIELD VERIFY EXACT SIZE AND LOCATION OF ALL EXISTING SERVICES PRIOR TO DEMOLITION.
- COORDINATE SHUT-DOWN OF ANY EXISTING SYSTEMS WITH THE BUILDING SERVICES PERSONNEL.
- WHERE DUCT AND/OR PIPE INSULATION HAS BEEN DAMAGED, THE CONTRACTOR SHALL REPAIR INSULATION A REQUIRED TO MATCH EXISTING.
- ALL ITEMS DEMOLISHED SHALL BE REMOVED FROM THE SIT AND DISPOSED OF PROPERLY.
- LIMITS OF DEMOLITION ARE INDICATED ON THE DRAWINGS. SHOULD EXISTING FIELD CONDITIONS REQUIRE MODIFICATIONS OF THESE LIMITS FOR THE PROPER INSTALLATION OF NEW WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUCH MODIFICATIONS.
- MECHANICAL TRADES SHALL COORDINATE ROUTING OF PIPING WITH OTHER TRADES PRIOR TO INSTALLATION.
- AREAS WITH EXISTING PLASTER (HARD) CEILINGS OR WALL TO BE CUT, REMOVED AND PATCHED BY ARCH. TRADES, COORDINATE AS REQUIRED.
- PROPERLY AND DISPOSE OF WASTE OIL AND DIESEL FUEL ASSOCIATED WITH TANKS AND PIPING TO BE REMOVED, PER EPA STANDARDS.

- DISCONNECT AND REMOVE DIESEL GENERATOR EXHAUST FLUE AND REPAIR THROUGH FLOOR PENETRATION TO FIRST FLOOR
- O DISCONNECT AND REMOVE DIESEL GENERATOR AND ASSOCIATED PIPING, FLUE AND FITTINGS
- 3 DISCONNECT AND REMOVE DIESEL FUEL TANK AND ASSOCIATED CONTAINMENT BASIN AND PIPING
- O DISCONNECT AND REMOVE DIESEL FUEL PIPING, FUEL VENT AND FUEL FILL PIPING AND FITTINGS ASSOCIATED WITH DIESEL GENERATOR AND FUEL TANK.
- 5 DISCONNECT AND REMOVE WASTE OIL TANK AND ASSOCIATED PIPING AND FITTINGS
- 6 REMOVE OIL PIPING DRAIN CONNECTION TO FLOOR ABOVE
- DISCONNECT AND REMOVE DIESEL GENERATOR EXHAUST FLUE AND ASSOCIATED MISULATION AND FITTINGS IN VEHICLE GARAGE AREA CAP FLUE NEAR CEILING AT THROUGH FLOOR PENETRATION TO SECOND FLOOR
- B DISCONNECT AND REMOVE CAPPED OIL PIPING DRAIN CONNECTION AT FLOOR
- DISCONNECT AND REMOVE EXISTING FUEL FILL CONNECTION IN DRIVEWAY AT GRADE

- CUT EXISTING BOLLARD FLUSH WITH CONCRETE SLAB AND GRIND FLUSH WITH FINISH FLOOR

- FILL AND SEAL OPENING IN EXISTING CONCRETE GARAGE FLOOR TO MATCH EXISTING
- FILL AND SEAL OPENING IN CONCRETE DRIVEWAY WATERTIGHT TO MATCH EXISTING
- FILL AND SEAL OPENING IN EXTERIOR WALL WATERTIGHT TO MATCH EXISTING.
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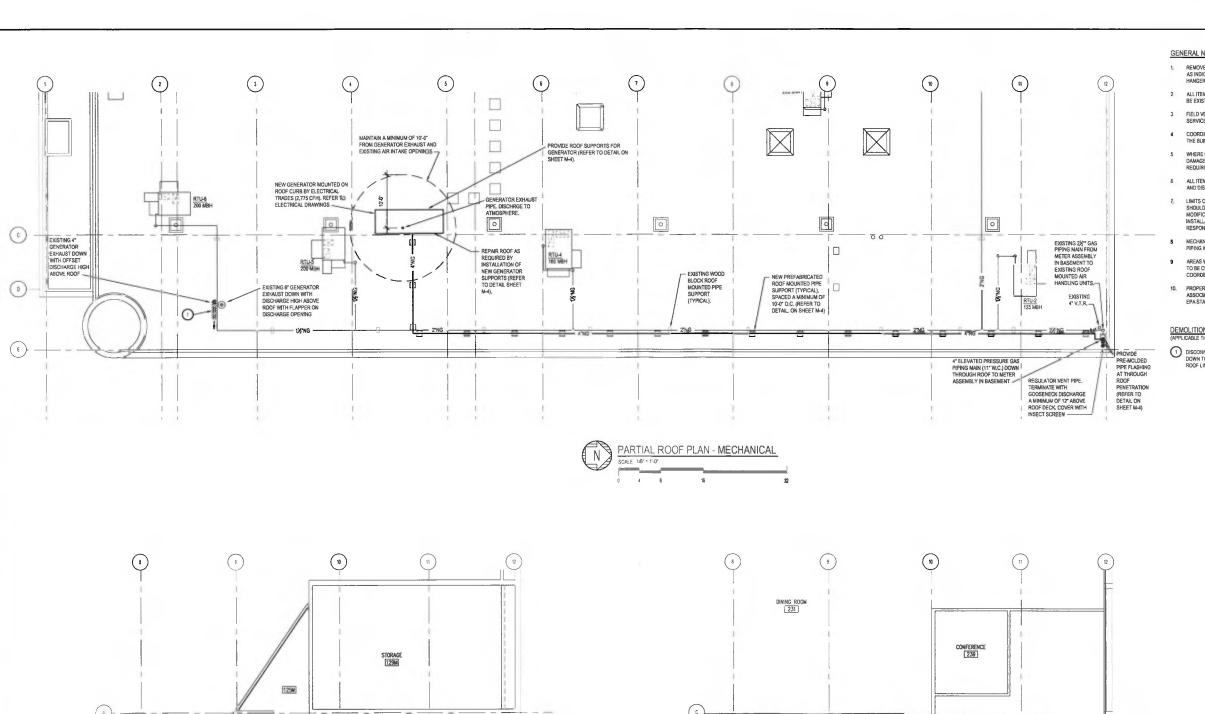


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CITY OF ANN ARBOR FIRE STATION #1 **GENERATOR** ANN ARBOR, MICHIGAN

> PARTIAL FLOOR PLANS -MECHANICAL



SQUAD DORM 128M

METER AND UP TO

CORE CONCRETE SLAB AT — NEW PIPE PENETRATION. SEAL PENETRATION AROUND PIPE (TYPICAL FOR ALL SLABS)

NEW 4" ELEVATED PRESSURE NG AND REGULATOR VENT PIPING UP TO 2ND FLOOR AND MAIN DOWN TO METER ROOM

REMOVE AND REPLACE
[GYPSUM BOARD AS REQUIRED FOR
INSTALLATION OF PIPING.
PATCH GYPSUM BOARD AND PAINT
TO MATCH EXISTING ADJACENT
CONSTRUCTION.

PARTIAL MEZZANINE PLAN - MECHANICAL

126M

SCALE 1/8" = 1'-0"

DUTY CHIEF

# GENERAL NOTES:

- REMOVE EXISTING MECHANICAL SERVICES AND EQUIPMENT AS INDICATED AND/OR DESCRIBED ALONG WITH SUPPORTS, HANGERS, CONTROLS AND ALL RELATED ACCESSORIES.
- 2 ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED TO BE EXISTING UNLESS OTHERWISE NOTED.
- 3 FIELD VERIFY EXACT SIZE AND LOCATION OF ALL EXISTING SERVICES PRIOR TO DEMOLITION.
- 4 COORDINATE SHUT-DOWN OF ANY EXISTING SYSTEMS WITH THE BUILDING SERVICES PERSONNEL.
- WHERE DUCT AND/OR PIPE INSULATION HAS BEEN DAMAGED, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.
- ALL ITEMS DEMOLISHED SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.
- 7. LIMITS OF DEMOLITION ARE INDICATED ON THE DRAWINGS SHOULD EXISTING FIELD CONDITIONS REQUIRE MODIFICATIONS OF THESE LIMITS FOR THE PROPER INSTALLATION OF NEW WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUCH MODIFICATIONS.
- MECHANICAL TRADES SHALL COORDINATE ROUTING OF PIPING WITH OTHER TRADES PRIOR TO INSTALLATION.
- AREAS WITH EXISTING PLASTER (HARD) CEILINGS OR WALLS TO BE CUT, REMOVED AND PATCHED BY ARCH, TRADES, COORDINATE AS REQUIRED.
- PROPERLY AND DISPOSE OF WASTE OIL AND DIESEL FUEL ASSOCIATED WITH TANKS AND PIPING TO BE REMOVED, PER EPA STANDARDS.

# DEMOLITION KEYED NOTES: (APPLICABLE THIS SHEET ONLY)

DISCONNECT AND REMOVE GENERATOR EXHAUST FLUE DOWN TO BELOW ROOF LINE CAP AND SEAL FLUE BELOW ROOF LINE AND REPAR ROOF REFER TO DETAIL

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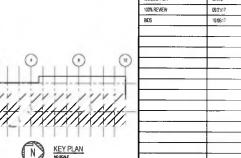
CITY OF ANN ARBOR

FIRE STATION #1 **GENERATOR** 

ANN ARBOR, MICHIGAN

PARTIAL FLOOR PLANS -MECHANICAL

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KEY PLAN



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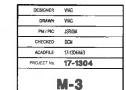
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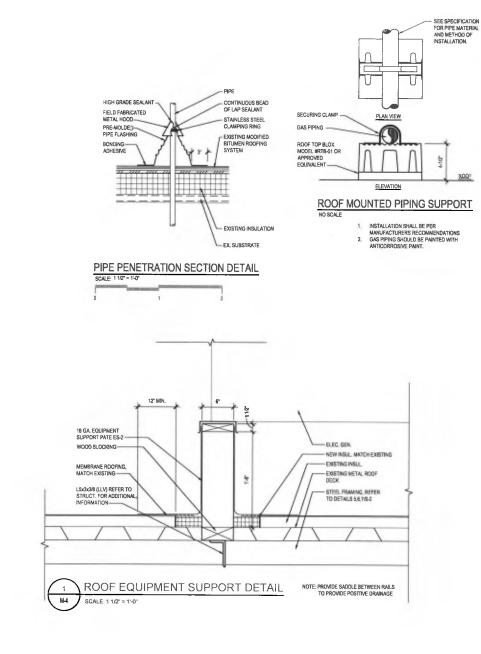


REMOVE AND REPLACE
GYPSUM BOARD AS REQUIRED FOR
INSTALLATION OF PIPING,
PATCH GYPSUM BOARD AND PAINT
TO MATCH EXISTING ADJACENT
CONSTRUCTION.

AND 4" NG PIPING DOWN TO METER ROOM

NEW PIPE PENETRATION.
SEAL PENETRATION
AROUND PIPE (TYPE AL
FOR ALL SLABS)







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CITY OF ANN ARBOR
FIRE STATION #1
GENERATOR
ANN ARBOR, MICHIGAN

MECHANICAL DETAILS

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DRAWN	WAG
DESIGNER	WAG

- OCTRACTOR TO SIZE FEEDERS AND BRANCH CIRCUITS BASED ON THIS SCHEDULE AND OVER CURRENT DEVICE SIZE, LINLESS NOTED OTHERWISE, EXCEPT WHERE VOLTAGE DROP EXCEEDING 2% FOR FEEDERS AND 3% FOR BRANCH CIRCUITS WOULD RESULT, WHERE LARGER CONDUCTORS SHALL BE USED, AS REQUIRED.

  CONDUCTORS ARE BASED ON THHINTHWN UP TO AND INCLUDING \$40, LARGER THAN \$40 ARE BASED ON TYPE AND THE WAS THAN \$40 ARE BASED ON THE WAS THAN \$40 ARE BASED ON THE CONDUCTOR SIZES FOR CIRCUITS RATED LOSD OR NORE ARE BASED ON TYPE CONDUCTOR TEMPERATURE. CONDUCTOR SIZES FOR CIRCUITS RATED AND A OR NORE ARE BASED ON TYPE CONDUCTOR TEMPERATURE. FOR CIRCUITS RATED AND A OR NORE ARE BASED ON TYPE CONDUCTOR TEMPERATURE. FOR CIRCUITS RATED AND A OR NORE ARE BASED ON TYPE CONDUCTOR TEMPERATURE. FOR CIRCUITS RATED AND A OR NORE. CIRCUITS IN DRY LOCATIONS MAY BE SIZED BASED ON SYC CONDUCTOR TEMPERATURE FOR CIRCUITS OR THE METATURE PER NEC PROVIDED DEVICE TERMINATIONS AND RATED AND UISTED FOR 90°C OR MORE.

  ALL CAUCHATIONS FOR WIRING AND CONDUIT SIZES SHOW IN FIZE 201 AND CONDUIT SIZES SHOWN ARE WINNIMM AND ARE APPLICABLE FOR ELECTRICAL METALLIC TUBING (EMT), RIGID METAL CONDUIT (RINC) AND PVC TYPES, ACTUAL CONDUIT SIZES TO BE INSTALLED MAY VARY.

	SYMBOL LIST	
SYMBOL	DESCRIPTION	
8	EXIT LIGHT - CEILING MOUNTED	
•	EXIT LIGHT - WALL MOUNTED	
44	EMERGENCY LIGHTING UNIT	
	RECESSED 2 x 2 FLUORESCENT FIXTURE	
	RECESSED 2' x 4' FLUORESCENT FIXTURE	
	FIXTURE ON NIGHT LIGHT CIRCUIT	
	FIXTURE WITH CENTER LAMP ON NIGHT LIGHT CIRCUIT	
	FIXTURE ON NIGHT LIGHT CIRCUIT	
	SURFACE MOUNTED OR SUSPENDED FLUORESCENT FIXTURE	
4	WALL MOUNTED PLUORESCENT FIXTURE	
0	RECESSED INCANDESCENT, FLUORESCENT, OR HID FIXTURE	
•	RECESSED FIXTURE ON NIGHT LIGHT CIRCUIT	
s	SINGLE POLE SWITCH	
Sı	THREE WAY SWITCH	
ş	DUAL LEVEL SWITCHING, ONE SWITCH FOR INNER ROW LAMPS AND ONE SWITCH FOR OUTER ROW LAMPS	
S:	MANUAL MOTOR STARTER WITH THERMAL PROTECTION	
0	SINGLE PHASE MOTOR	
ø	THREE PHASE MOTOR	
20°	COMBINATION MAGNETIC STARTER / DISCONNECT SWITCH (FUSED)	
<u></u>	CONTROL PANEL BY MECHANICAL TRADES	
	CONTROL PANEL BY MECHANICAL TRADES  LIGHTING / RECEPTACLE / EQUIPMENT PANEL	
ㅁ	LIGHTING / RECEPTACLE / EQUIPMENT PANEL  DISCONNECT SWITCH, FUSED	
_	JUNCTION BOX	
П	JUNCTION BOX TRANSFORMER	
▽	DATA OUTLET	
<u>v</u>	TELEPHONE / DATA OUTLET	
*	TELEPHONE OUTLET	
<u> </u>	SINGLE RECEPTACLE OUTLET	
<b>*</b>	DUPLEX RECEPTACLE OUTLET	
*	DUPLEX RECEPTACLE OUTLET - (48° A.F.F. OR AS DIRECTED)	
#	DOUBLE DUPLEX RECEPTACLE WITH 2-GANG COVER	
AFF	AROVE FINISHED FLOOR	
E		
GFI	EXISTING EQUIPMENT / DEVICE	
R	GROUND FAULT INTERRUPTER  RELOCATED EQUIPMENT / DEVICE	
WP	WEATHERPROOF	
NL	NIGHT LIGHT	
	EXISTING TO REMAIN	
<del>///</del>	EXISTING TO BE REMOVED  NEW	

	ELECTRICAL SHEET INDEX
SHEET DESCRIPTION	
E-1	ELECTRICAL GENERAL INFORMATION & ONE-LINE DIAGRAM
E-2	ELECTRICAL PLANS - DEMOLITION
E-3	ELECTRICAL PLANS - NEW WORK
E-4	DIAGRAMS AND DETAILS
E-5	ELECTRICAL SPECIFICATIONS
E-6	ELECTRICAL SPECIFICATIONS

## OVERVIEW OF FLECTRICAL SCOPE

THIS OMERMEN OF SCOPE IS INCLUDED TO GIVE THE CONTRACTOR A GENERAL OVERMEN OF THE PROJECT REQUIREMENTS. THE OMERMEN IS NOT ALL INCLUSIVE AND IS NOT INTERDED TO, AND SHAULD NOT BE USED TO, ESTABLISH CONTRACT UNITS OR PRINCIP UNIONS. THE CONTRACT DOCUMENTS SHALL BE USED TO ESTABLISH CONSTRUCTION CONTRACT SCOPE.

### THIS OVERVIEW OF SCOPE INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

ELECTRICAL:

1. DISCONNECT EXISTING DIESEL ENGINE GENERATOR AND REMOVE ASSOCIATED FEEDERS AND RE

- DISCONNECT EXISTING DIESEL ENGINE GENERATOR AND REMOVE ASSOCIATED FEEDERS AND BRANCH CIRCUITS
  DISCONNECT AND REMOVE EXISTING 800A AUTOMATIC TRANSFER SWITCH.
  FURBISH AND INSTALL NEW 200KW, 208Y/120Y,34,4W NATURAL GAS ENGINE GENERATOR AND ASSOCIATED FEEDER TO AUTOMATIC TRANSFER SWITCH.
  FURBISH AND INSTALL END 800A AUTOMATIC TRANSFER SWITCH AND ASSOCIATED INCOMING NORMAL AND STAND—BY POWER FEEDERS AND DUTOMON FEEDER TO EXISTING MAN DISTRIBUTION AND EXTRAL ENDING EXCREMATOR REMOTE STATUS AND ALARM PANEL AND ASSOCIATED COMMUNICATIONS CIRCUITS.
  FURBISH AND INSTALL EXPRESS CONTROL FROM AUTOMATIC TRANSFER SWITCH TO GENERATOR CONTROL FAMEL.
  FURBISH AND INSTALL SCHIRCL GREUITS FROM AUTOMATIC TRANSFER SWITCH TO GENERATOR CONTROL FAMEL.
  FURBISH AND INSTALL SCHIRCL GREUITS FROM AUTOMATIC TRANSFER SWITCH TO GENERATOR GOVERNOR SEPANCIES.
  FURBISH AND INSTALL SCHIRCL GREUITS FROM AUTOMATIC TRANSFER SWITCH TO GENERATOR GOVERNOR SEPANCIES.
  FURBISH AND INSTALL SCHIRCL GREUITS FROM AUTOMATIC TRANSFER SWITCH TO FROME TRANSFER SWITCH TO MINING THE SWITCH TO BUILDING SERVICE.
  FROMCE AND RESPONDED INSTALLATION DIMINARE OUTAGES TO BUILDING SERVICE.
  FROMCE AND RESPONDED TO MINING THE SWITCH TO SECOND FLOOR CILING SPACE.

### PROJECT REQUIREMENTS

PROVIDE ALL NECESSARY PERMITS. ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE OWNER'S STANDAROS, STATE AND LOCAL CODES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING CODES AND THEIR RELATED REFERENCES.

- 2014 NATIONAL ELECTRICAL CODE AS AMENDED BY THE 2014 MICHIGAN ELECTRICAL CODE RULES, PART 8.
- NFPA 101 LIFE SAFETY CODE 1997 AND 2006 (AS REFERENCED)
- MICHIGAN ENERGY CODE-ASHRAE 90.1-2013 2015 INTERNATIONAL FIRE CODE (AS REFERENCED)
- 2015 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS
- 2015 MICHIGAN MECHANICAL CODE 2015 MICHIGAN PLUMBING CODE
- 2015 INTERNATIONAL FUEL GAS CODE

MANUFACTURER AND MODEL NUMBER LISTED (GENERAC SG200) REPRESENTS THE BASIS OF DESIGN FOR THIS PROJECT. THE ELECTRICAL CONTRACTOR SHALL BEAR ALL ADDITIONAL COST ASSOCIATED WITH LUSING COUPLINEMT BY OTHER APPROVED MANUFACTURERS INCLUDING ADDITIONAL COSTS BY OTHER TRADES.

ALL EQUIPMENT INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE FIELD OR PROJECT CONDITIONS DO NOT ALLOW ALL MANUFACTURER'S RECOMMENDATIONS TO BE MET, THE INSTALLING CONTRACTOR SHALL SUBMIT IN WRITING TO THE ENGNEET THE PROPOSED DEMATION, IN A SKETCH FORM, ACCOMPANIED BY THE MANUFACTURER'S CONCURRENCE.



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CITY OF ANN ARBOR FIRE STATION #1 **GENERATOR** ANN ARBOR, MICHIGAN

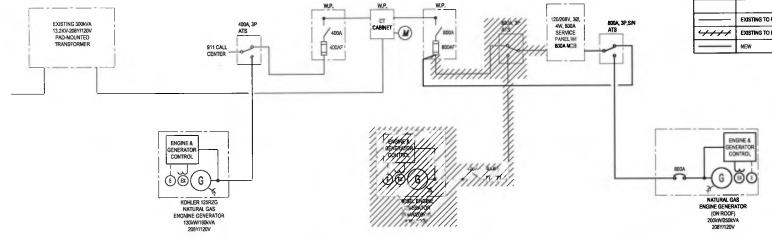
**ELECTRICAL GENERAL INFORMATION &** ONE-LINE DIAGRAM

These documents are natruments of service for sits salely with respect to the project. DSD and DSD's consultants small be opered the survivariance and other inspective unstruments of service and that ferban all common live statutions of service and that ferban all common live statutions and other inserviced rights, including compression DSD grants to the course a moreastured lecents or promotion DSD's instruments of service solely for the remotion of the course of the course of the course of promotion DSD's instruments of service solely for the remotion of the course of the course of promotion of the course of the course of promotion of the course of the course of promotion uses and mediation of the course of promotion of the course of promotion of the course of t

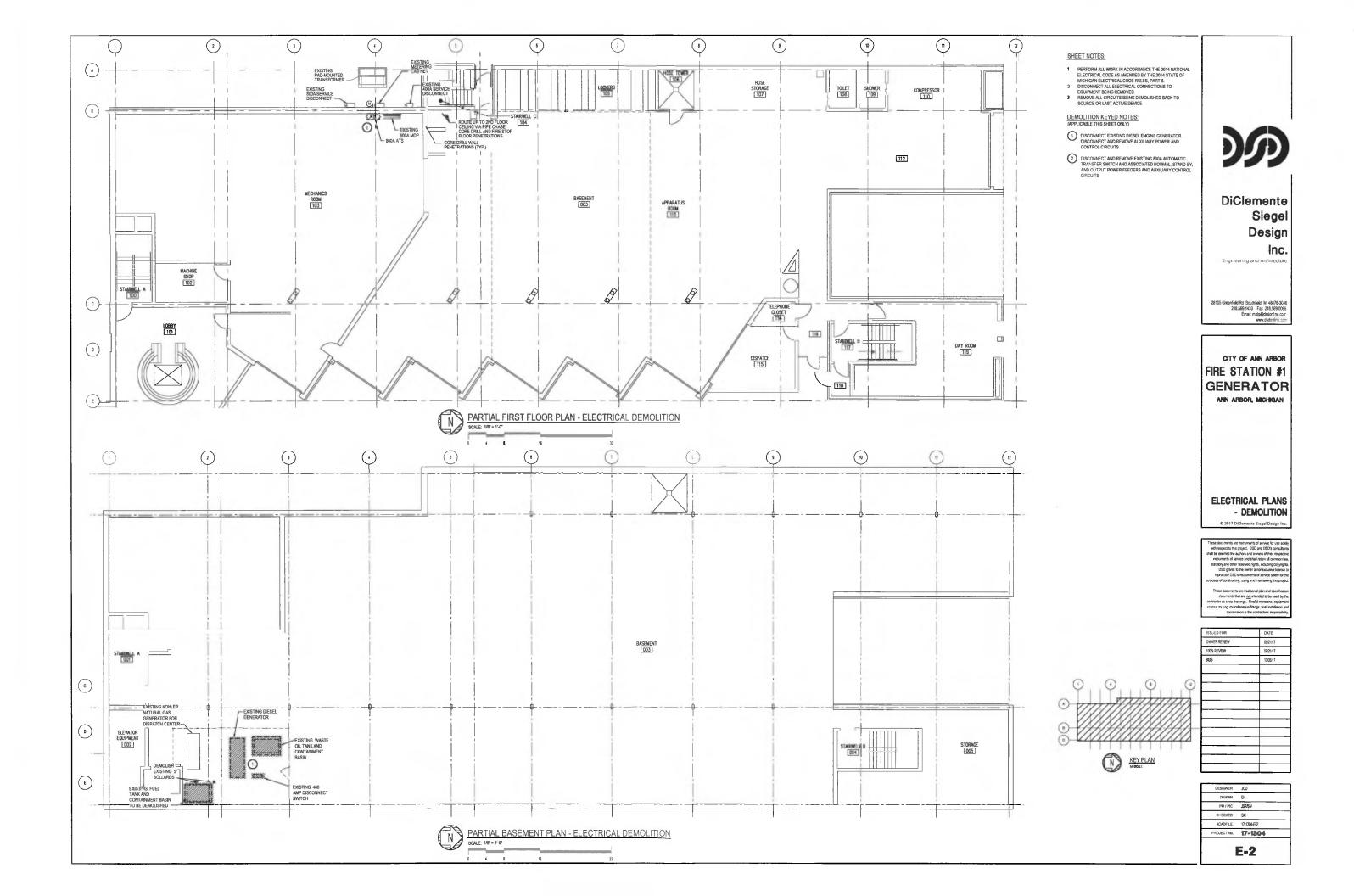
These documents are traditional plan and specific documents that are not intended to be used by the focuments that are not intended to be used by the ontractor as shop drawings. Final of mensions, equipment coess, routing, modellaneous fittings, final installation as coordination at the contractor's responsibility.

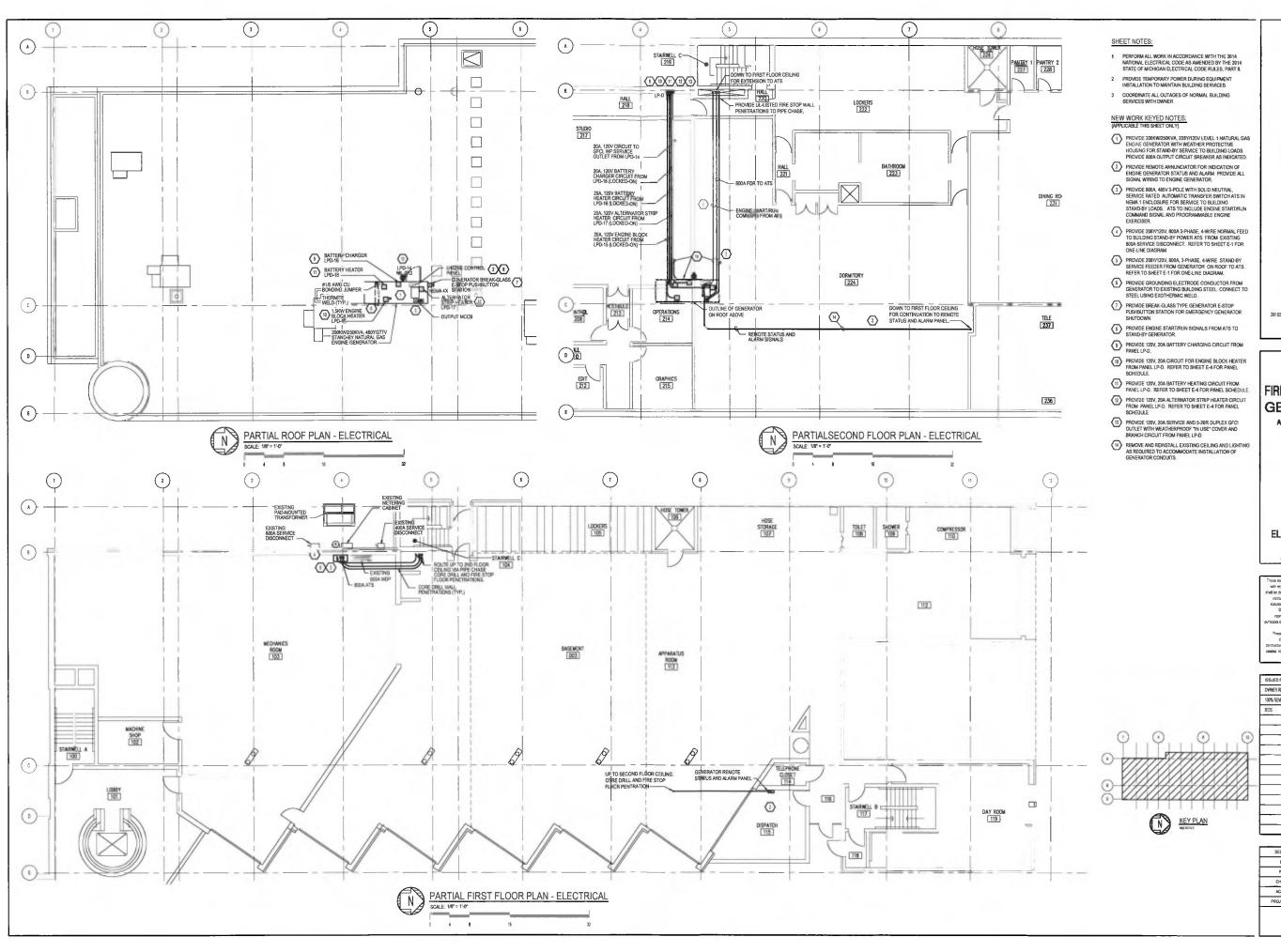
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OWNER REVIEW	09/21/17
100% REVIEW	09/21/17
80S	10/06/17

DRAWN.	JSR/SM
CHECKED:	SM
ACADFILE:	17-1304E-1
PROJECT No.	17-1304



ONE-LINE DIAGRAM









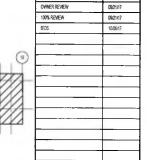
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**ELECTRICAL PLANS** - NEW WORK

These occurrents are instruments of service for use salely with respect to this project. DSD and DSD's consultant shall be deemed the authors and owners of their respective instruments of service and shall retain all common las statutory and other researced rights, noticing copyright OSD grants to the owner a nonexclusive Iceruse to

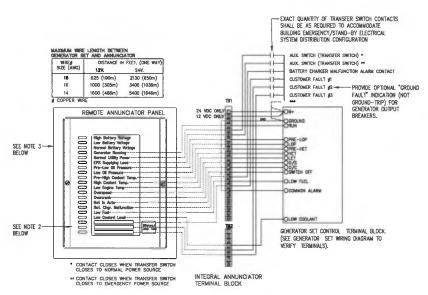


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		D DESIGNATION LP-D  AMP BUS M.C	B. X M.L.O.	MOUNTING: FLUSH x SUI	REACE	-
_		REQUIREMENTS	<u> </u>			_
XII	VA	LOAD TYPE	ABC	LOAD TYPE	VA	×
1	1100	LIGHTS	$\uparrow \land \downarrow \downarrow \downarrow \land$	(6) RECEPTACLES	1080	2
3	1600	LIGHTS	<del></del>	(5) RECEPTACLES	900	4
5	1600	LIGHTS	┇╱┼┼┿╱	(6) RECEPTACLES	1080	6
7	300	LIGHTS	<sup>1</sup> ∼+++∼	(7) RECEPTACLES	1260	8
9	1400	LIGHTS	<del>1</del> ∼╁┼∽	SPARE	-	10
11	-	SPARE	<u> </u>	SPARE	-	12
13	-	SPARE	1	GFCI ROOF SERVICE OUTLET	180	14
15	1500	STAND-BY GENERATOR COOLANT JACKET HEATER	<b>1</b> ~++-^	STAND-BY GENERATOR BATTERY CHARGER	300	16
17	750	STAND-BY GENERATOR ALTERNATOR STRIP HEATER	$1 \sim + + + \sim$	STAND-BY GENERATOR BATTERY HEATER	750	18
19	1,200	EXISTING LOAD	7~+++~	EXISTING LOAD	1,200	20
21	1,200	EXISTING LOAD	<del></del>	EXISTING LOAD	1,200	22
23		SPACE	ļ. —	SPACE		24
		6,000 VA AT 10 E 4,500 VA AT 10 E - VA AT 5				

# NOTES:

- 1. CONTRACTOR TO UPDATE THE PANEL DIRECTORY.
  2. ALL BREAKERS ARE EXISTING 20A-1P.
  3. CONTRACTOR TO FIELD VERRY PANEL CONDITIONS PRIOR TO COMMENCEMENT OF WORK.
  4. CIRCUIT NUMBERS SHOWN ARE FOR DESIGN INTENT ONLY.



# TYPICAL UTILITY BACKUP GENERATOR REMOTE ANNUNCIATOR PANEL DETAIL

NOT TO SCALE

NOTES

1. DIAGRAM IS SHOWN FOR REFERENCE ONLY, EXACT QUANTITY AND TYPE OF INTERCONNECTION WRING SHALL BE DETERMINED BY MANUFACTURER'S REQUIREMENTS.

- 2 "GROUND FAULT" CONDITION (NOT GROUND-TRIP) OF GENERATOR OUTPUT BREAKERS SHALL BE MONITORED AT THE REMOTE ANNUNCIATOR.
- 3 LOCATE REMOTE ANNUNCIATOR PANEL AT FIRST FLOOR, ROOM 115 (OLD



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CITY OF ANN ARBOR FIRE STATION #1 **GENERATOR** ANN ARBOR, MICHIGAN

> DIAGRAMS & DETAILS

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ISSUED FOR	DATE
OWNER REVIEW	09/21/17
100% REVIEW	09/21/17
BIDS	10/06/17
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GENERAL
ALL ELECTRICAL WORK SHALL COMPLY WITH THE LATEST EDITION OF N.E.C., LOCAL AND STATE CODES,
ODDINAMOUS AND REGILL ATTOMS. INCLUDING THE OCCUPATIONAL SAFETY AND HEALTH ACT, (OSHA).

<u>Work included</u> The Contractor Shall Provide all Items, articles, materials, operations, or methods mentioned, LISTED OR SCHEDULED ON THE DRAWINGS AND IN THESE SPECIFICATIONS, INCLUDING ALL LABOR, MATERIALS. EQUIPMENT, AND ALL INCIDENTALS NECESSARY REQUIRED FOR THE COMPLETION AND OPERATION OF ALL

THE INSTALLATION SHALL BE MADE SO THAT ALL COMPONENT PARTS FUNCTION TOGETHER AS A WORKABLE SYSTEM. IT SHALL BE COMPLETE WITH ALL ACCESSORIES NECESSARY FOR PROPER OFERATION, WHEN THE INSTALLATION IS COMPLETE, ALL GUIPMENT SHALL BE OPERATIVE AND IN PROPER ADJUSTMENT, ALL WORK SHALL BE EXECUTED IN COMPORAITY WITH THE BEST PRACTICE SO AS TO CONTRIBUTE TO EFFICIENCY OF OPERATION, MINIMUM MAINTENANCE, ACCESSIBLITY AND SIGHTLINESS.

TO ACCOMPLISH THESE RESULTS. THE CONTRACTOR SHALL CONSULT THE ARCHITECTS AND ENGINEERS: PLANS COVERING THE VARIOUS OTHER TRADES, THE FIELD LAYOUTS OF THE CONTRACTORS FOR THESE TRADES AND THEIR SHOP DRAWINGS. HE SHALL COORDINATE HIS WORK ACCORDINGLY.

LOCAL CONDITIONS
THE CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH CONDITIONS WHICH WILL
THE CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH CONDITIONS WHICH WILL
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THE CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH CONDITIONS WHICH WILL
THE CONTRACTOR SHALL PROPERTY OF THE S AFFECT THE WORK HE IS TO PERFORM. THE SUBMISSION OF A PROPOSAL BY THIS CONTRACTOR SHALL BE CONCLUSIVE EVIDENCE THAT IT HIS CONTRACTOR HAS WISTED THE SITE AND HAS GINNER PROPOSAL. ON CONSIDERATION AND EVALUATION OF THESE CONDITIONS IN THE PREPARATION OF HIS PROPOSAL, NO ALLOWANCE SHALL SUBSEQUENTLY BE MADE ON HIS BEHALE FOR EXTRA EXPENSE INCURRED DUE TO FAILURE OR NEGLECT ON HIS PART TO MAKE THIS VISIT AND EXAMINATION.

WHERE ACTIVE SEWERS, GAS, ELECTRIC, OR OTHER SERVICES ARE ENCOUNTERED DURING THE PERFORMANCE OF THIS CONTRACT. THE CONTRACTOR SHALL PROTECT, BRACE AND SUPPORT THEM AS REQUIRED. DO NOT PREVENT, INVERRUPT OR DISTURB OPERATION OF EXISTING SERVICES THAT ARE TO REMAIN, RELOCATE EXISTING SERVICES IF REQUIRED. DRAWINGS SHOW APPROXIMATE LOCATIONS OF

PERMITS AND INSPECTIONS
THE CONTRACTION SHALL TAKE OUT ALL PERMITS AND ARRANGE FOR ALL NECESSARY INSPECTIONS AND
SHALL PAY ALL FEES AND EXPENSES IN CONNECTION THEREWITH AS A PART OF HIS WORK UNDER THEIR
CONTRACT.

UPON COMPLETION OF THE WORK, THEY SHALL FURNISH TO THE OWNER ALL CERTIFICATES OF INSPECTION AND APPROVAL WHICH ARE CUSTOMARY FOR THE CLASSES OF WORK INVOLVED.

RULES, CODES AND STANDARDS
ALL WORK SHALL BE PERFORMED OR INSTALLED IN STRICT ACCORDANCE WITH ALL APPLICABLE RULES. TRUMA GRINLE DE PERFURMED OR INSTALLED IN STRICT ACCORDANCE WITH ALL APPLICABLE RULES, REGULATIONS AND CODES OF LOCAL, STATE AND FEDERAL GOVERNMENTS, OR OTHER AUTHORITIES HAVING LAWFUL JURISDICTION, AND EACH CONTRACTOR AND SUBCONTRACTOR SHALL BE RESPONSIBLE FOR SUCH COMPLINCE.

ALL ELECTRICAL WORK AND EQUIPMENT SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ISSUE OF THE NATIONAL ELECTRICAL CODE, NFPA, ADA AND SHALL BEAR THE LABEL OF LISTING WITH THE UNDERWRITERS' LABORATORIES.

SHOP DRAWNOS
COMPLETE SHOP DRAWINGS FOR ALL ELECTRICAL MANUFACTURED ITEMS SHALL BE SUBMITTED TO THE
ARCHITECTS AND ENGINEERS FOR APPROVAL BEFORE FABRICATION OF THE ITEMS, DRAWINGS SHALL
INDICATE MAKE OF PROJECT AND HAME OF CONTRACTOR.

THE CONTRACTOR SHALL THOROUGHLY CHECK ALL SHOP DRAWINGS AS REGARDS TO MEASUREMENTS, SIZES OF EQUIPMENT, MATERNALS AND DETAILS TO SATISFY HIMSELS THAT THEY CONFORM TO THE INTENT OF ENGINEER'S DRAWINGS AND SPECIFICATIONS. DRAWINGS FOUND TO BE NACCURATE OR OTHERWISE IN ERROR ARE TO BE RETURNED TO THE SUBCONTRACTORS FOR CORRECTION BEFORE SUBMITTIMG SAME TO

THE CHECKING AND APPROVING OF SHOP DRAWINGS BY THE ENGINEERS SHALL BE CONSTRUED AS ASSISTING THE CONTRACTOR, AND THE ENGINEERS ACTION DOES NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY FOR ERRORS OR OMISSIONS WHICH ANY EXIST THEREON, WHERE ERRORS OR OMISSIONS ARE DISCOVERED LATER, THEY MUST ACCORDINGLY BE MADE GOOD BY THE CONTRACTOR.

DRAWINGS NOT APPROVED MUST BE CORRECTED AND RETURNED FOR FINAL APPROVAL NO SHOP DRAWINGS SHALL BE USED ON THE WORK UNLESS APPROVED BY THE ENGINEERS. ELECTROWIC COPIES OF ALL ORAWINGS USBHITTED MUST BE IN POF FORMAT. THE CONTRACTOR SHALL PURNISH TO THE FIELD, PRINTS OF CHECKED AND APPROVED SHOP DRAWINGS AS REQUIRED BY THE CONSTRUCTION OPERATIONS. COST FOR DUPLICATION OF MARKED DRAWINGS SETS SHALL BE BORNE BY THE CONTRACTOR.

AFTER SHOP DRAWINGS HAVE BEEN SUBMITTED TO THE ENGINEER AND RETURNED TO THE CONTRACTOR APPROVED, THE CONTRACTOR WILL NOT BE ALLOWED TO RESUBMIT SHOP DRAWINGS OF ANOTHER MANUFACTURER FOR THIS SAME ITEM WITHOUT THE ENGINEER'S CONSENT.

SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:

NATURAL GAS ENGINE GENERATOR AUTOMATIC TRANSFER SWITCH

EXTRA WORK
FOR ANY EXTRA ELECTRICAL WORK WHICH MAY BE PROPOSED, THIS CONTRACTOR SHALL FURNISH TO THE
CONSTRUCTION MANAGER AN ITEMIZED BREADOWN OF THE ESTIMATED COST OF THE MATERIALS AND LASOR
REQUIRED TO COMPLETE THIS WORK THE CONTRACTOR SHALL PROCEED ONLY AFTER RECEIVING A MATERIA
ORDER FROM THE CONSTRUCTION MANAGER ESTABLISHING THE AGREED PRICE AND DESCRIBING THE WORK
TO BE DONE.

SCHEDULE OF WORK

ATT WORK REQUIRED IN OCCUPIED AREAS OF THE BUILDING, OR WORK WHICH WOULD DISRUPT BUILDING. ACL TION REQUIRED TO OCCUPIED MEETS OF THE BOUISM, ON WOMEN MITTIEN TOOLD USAGED FOR SOME OCCUPANTS SHALL BE COORDINATED WITH THE OWNER, INCLIDING WORK PERFORMED DURING OFF HOURS (HOLE CORING AND POWER SHITDOWNS), PROVIDE A MINIMUM OF TWO DAYS ADVANCE NOTICE TO OWNER FOR SHITDOWN, INCLIDE ALL COSTS IN BIS FOR OFF HOURS WORK.

COORDINATE ALL WORK WITH THAT OF OTHER TRADES, PERFORM WORK IN A PHASED MANNER AS REQUIRED TO ACCOMMODATE THE PROJECT CONSTRUCTION SCHEDULE. COORDINATE ALL WORK AND THE SEQUENCE OF INSTALLATION MITH THE CONSTRUCTION MANAGER.

UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR ATTEMPT TO CONNECT NEW ELECTRICAL DEVICES, CIRCUITS, WIRING, EQUIPMENT, ETC., TO EXISTING EMERGIZED POWER DISTRIBUTION EQUIPMENT, PANELBOARDS, ETC., MAKE ARRANGEMENTS WITH THE CONSTRUCTION MANAGER FOR A POWER SHUTDOWN(S) AS REQUIRED.

DEMOLITION
DISCONNECT, REMOVE, OR RELOCATE PRESENT EQUIPMENT, OUTLETS, FIXTURES, DEVICES, ETC., AS INDICATED ON PLAN. HEREIN SPECIFIED, OR AS OTHERWISE REQUIRED TO CONFORM TO THE ELECTRICAL MECHANICAL OR ARCHITECTURAL REVISIONS.

REMOVED MATERIALS, EXCEPT AS OTHERWISE INDICATED, SHALL NOT BE REUSED. THIS CONTRACTOR SHALL REMOVE SAME FROM THE PREMISES EXCEPT ITEMS AS MAY BE DESIGNATED AS SALVAGEABLE BY THE OWNERS REPRESENTATIVE AND THESE ITEMS SHALL BE DELIVERED TO THE OWNER FOR THEIR DISPOSITION, DELIVERY SHALL INCLUDE PLACING THE ITEMS AT ANY LOCATION WITHIN THE BUILDING AS SO DIRECTED BY THE FINANCE.

CUTTING AND PATCHING NO CHOLES THROUGH BEAMS OR OTHER STRUCTURAL MEMBERS SHALL BE DONE WITHOUT THE SPECIFIC PERMISSION OF THE ARCHITECT.

ALL OPENINGS IN WALLS, CEILINGS, OR FLOORS MADE BY THE CONTRACTOR SHALL BE NEATLY PATCHED BY

ALL MEASUREMENTS NECESSARY FOR THE PROPER INSTALLATION OF MATERIALS OR APPARATUS SHALL BE TAKEN IN THE FIELD. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE CORRECT FIT OF WORK INSTALLED.

TESTS AND ADJUSTMENTS
ALL ELECTRICAL CIRCUITS SHALL BE TESTED AS SOON AS CONDUCTORS ARE INSTALLED, AND FINAL TESTS
SHALL BE MADE IN PRESENCE OF THE OWNER'S REPRESENTATIVE, WHEN ALL WORK IS COMPLETE, IF
REQUIRED, IF CIRCUITS ARE NOT PROPERLY CONTROLLED AND INSULATED, MAKE NECESSARY CHANGES AND

"AS-BUILT" CONDUIT DRAWINGS AT COMPLETION, THE CONTRACTOR SHALL FURNISH TO THE OWNER ONE (1) COMPLETE SET OF OF VELLUM AT COMPLETENT, THE CONTINGENT AND WEST DINNERSHONED WHERE REQUIRED TO SHOW ALL VARIATIONS BETWEEN ACTUAL CONSTRUCTION AS BUILT AND WORK AS INDICATED ON THE PRINTED DRAWNINS, INCLUDING ALL CHANGES IN LOCATIONS, SUES, ETC. MARKINGS SHALL BE IN REFOR ADDITIONS AND GREEN FOR DELETIONS. THESE REPRODUCIBLE VELLUM PRINTS SHALL BE NEW SETS PURCHASED FROM THE ARCHITECT, EACH SHEET CERTIFIED AS BUILT BY THE CONTRACTOR, AND TURNED OVER TO THE OWNER IN GOOD CONDITION.

GUARANTEE AND WARRANTY
CONTRACTOR SHALL GUARANTEE ALL WORK INSTALLED BY HIM OR HIS SUBCONTRACTORS TO BE FREE FROM CONTINUE IDESTRUCTION AND EMPORTED BY A MATERIAL AND WORK INSTALLED OF OTHER WIND LIGHT IN UTILIS SHOULD WIND AND THE DATE OF FINAL ACCEPTANCE OF THE MORK, UNLESS A LONGER PERSON OF THE ATTENDED OF THE YEAR FOLLOWING THE DATE OF FINAL ACCEPTANCE OF THE MORK, UNLESS A LONGER PERSON OF SIPILAL ACCEPTANCE OF THE MORK OF REPLACE AT NO ADMITTIONAL CONTROL OF THE MORE O

REPAIRS OR REPLACEMENTS SHALL BEAR ADDITIONAL TWELVE (12) MONTHS GUARANTEE, AS ORIGINALLY CALLED FOR, DATED FROM THE FINAL ACCEPTANCE OF THE REPAIR OR REPLACEMENT, THIS REQUIREMENT SHALL BE BINDING EVENTHOUGH IT WILL EXCEED PRODUCT GUARANTEES NORMALLY FURNISHED BY SOME MANUFACTURES.

CONTRACTOR SHALL SUBMIT HIS OWN AND EACH EQUIPMENT MANUFACTURER'S WRITTEN CERTIFICATES, ANTING THAT EACH ITEM OF EQUIPMENT FURNISHED COMPLIES WITH ALL REQUIREMENTS OF TH DRAWINGS AND SPECIFICATIONS.

NOTE THAT GUARANTEE SHALL RUN FROM DATE OF FINAL ACCEPTANCE OF THE WORK, NOT FROM DATE OF INSTALLATION OF A DEVICE OR PIECE OF EQUIPMENT

PAINTING
PAINT ALL IRON WORK AND OTHER MISCELLANEOUS IRON TWO COATS OF AN APPROVED SILICONE ALKYD
ENAMEL PAINT, COLOR OF PAINT SHALL BE SELECTED SUCH THAT IT BLEND WITH SURROUNDINGS.

XPOSED CONDUIT INSTALLED IN ROOMS OTHER THAN MECHANICAL OR BOILER ROOMS OR VEHICLE GES SHALL BE PAINTED BY THE CONTRACTOR, COLOR TO BLEND IN WITH EXISTING COLOR SCHEME

LABELING PROVIDE HARRE LAYER LAWINATED PLASTIC NAME PLATES TO IDENTIFY ALL ELECTRICAL EQUIPMENT INSTALLED UNDER THIS CONTRACT OR AS NOTED.

EQUIPMENT TO RECEIVE NAME PLATE SHALL INCLUDE, BUT NOT BE LIMITED TO: PANELBOARDS, SAFETY SWITCHES, BUS PLUGS, CONTROL PANELS, STARTERS.

NAME PLATES SHALL INCLUDE THE FOLLOWING INFORMATION - EQUIPMENT IDENTIFICATION, CIRCUIT NUMBER,

NAME PLATES SHALL BE SECURED TO PANELBOARDS, SAFETY SWITCHES, ENCLOSED CIRCUIT BREAKERS, IN CONSPICUOUS LOCATION, PARALLEL TO EQUIPMENT LINES USING SCREWS, RIVETS, OR PERMANENT ADRESNE. NAME PLATES ON BUS PLUGS OR BUS TAP BOXES SHALL BE LOCATED ON BOTTOM OF PLUG OR BOX TO BE FOR FROM PRINCIPLE OF THE PROPERTY OF THE

SWITCHES AND RECEPTACLES SHALL BE IDENTIFIED AS TO CIRCUIT NUMBER AND PANELBOARD FED FROM UC PERMANENT MARKER ON INSIDE FACE OF DEVICE COVER PLATE.

ALL JUNCTION AND PULL BOXES LOCATED ABOVE SUSPENDED CEILINGS SHALL 8E MARKED ON THE OUTSIDE OF COVER TO IDENTIFY THE PANEL FED FROM AND THE CIRCUIT NUMBER USING PERMANENT MARKER.

ALL BOXES LOCATED IN EXPOSED CEILING AREAS SHALL BE MARKED ON THE INSIDE OF COVERS TO IDENTIFY

ALL ELECTRICAL EQUIPMENT SHALL BE PROVIDED WITH CONTRACTOR INSTALLED ARC FLASH LABELING IDENTIFYING THE ARC FLASH HAZARD PRE LEVEL AND BOUNDARY, BASED UPON ACCURATE SHORT CIRCUIT AND ARC FAULT ANALYSIS, ALL ACFLASH DOCUMENTS SHALL BE UPDATED BY A LICENSED, PROFESSIONAL ENGINEER, UNDER CONTRACT VIA THE ELECTRICAL CONTRACTOR.

CONDUITS AND FITTINGS
CONDUIT MADORITY PARTITIONS, EXPOSED IN MECHANICAL AREAS, DUTSIDE OF MECHANICAL AREAS WITHIN
48" OF FLOOR AND CONDUIT LARGER THAN 2" SHALL BE HOT-DIP GAL VANIZED, RIGID HEAVY WALL TYPE,
UNLESS OTHERWISE NOTED.

CONDUIT 2" AND SMALLER WHICH IS CONCEALED IN DRYWALL PARTITIONS, ABOVE ACCESSIBLE CEILINGS AND WHERE EXPOSED ABOVE 46" AFF, SHALL BE ELECTRICAL METALLIC TUBING.

CONDUITS EXPOSED TO THE WEATHER SHALL BE RIGID GALVANIZED CONDUITS, CONDUIT FITTINGS AT THESE LOCATIONS SHALL BE NONFERROUS CAST TYPE EQUIPPED WITH GASKETED COVERS.

CONDUIT SHALL BE DELIVERED TO THE SITE IN STANDARD 10 FOOT LENGTHS, EACH LENGTH BEARING THE UL LABEL. HOT-DIP GALVANIZED CONDUIT SHALL BE SO LABEL ED.

MINIMUM SIZE OF CONDUIT SHALL BE 3/4", UNLESS OTHERWISE NOTED.

ALL CONDUIT SHALL BE SECURELY FASTENED IN PLACE WITH APPROVED CLAMPS AND CAREFULLY REAMED BEFORE INSTALLING.

CONDUITS SHALL NOT BE INSTALLED WITHIN 3" OF HOT WATER OR STEAM LINES.

COMDUITS IN MECHANICAL FOLIPMENT SPACES AND UNFINISHED AREAS MAY BE RUN EXPOSED, ALL OTHER CONDUITS IN MECHANICAL EQUIPMENT SPACES AND UNFINISHED AREAS MAY BE RUN EXPUSED. ALL DITHER CONDUITS HALL BE CONCEALED, UNLESS OTHERWISE NOTED, EXPOSED CONDUIT SHALL BE INSTALLDED FOR PARALLEL, OR AT RIGHT ANGLES TO ADJACENT BUILDING LINES AND SHALL BE SUPPORTED AT INTERVALS NOT EXCEEDING EIGHT FEET.

GROUPS OF CONDUITS, WHERE SUSPENDED, SHALL BE SUPPORTED ON TRAPEZE TYPE HANGERS, USING 3/8\* ROD AND CHANNEL IRON OR UNISTRUT. INDIMUDUAL CONDUITS NOT SUPPORTED ON PIPE STRAPS SHALL BE PROVIDED WITH CONDUIT CLAMPE OR STRENUP HANGERS SUSPENDED ON RODS. PERFORATED IRON STRAPS OR SOFT IRON WIRE FOR PIPE SUPPORTS SHALL NOT BE USED.

NO BEAMS OR OTHER STRUCTURAL MEMBERS SHALL BE DRILLED, BURNED, OR CUT WITHOUT WRITTEN APPROVAL OF THE ENGINEER.

CONNECTORS AND COUPLINGS FOR ELECTRICAL METALLIC TUBING SHALL BE OF THE SET-SCREW TYPE AS MANUFACTURED BY 18.8. MIDWEST, OR ELECTRIC TUBE PRODUCTS CO.

ALL CONDUITS CALLED OUT TO BE STUBBED OFF SHALL HAVE PROPER BUSHINGS. FINISH, ETC. SO THAT NO ROUGH EDGES ARE LEFT AT END OF CONDUITS. ALL WIRING SHALL BE ENCLOSED IN A METAL RACEWAY UNLESS OTHERWISE NOTED. ALL EMPTY CONDUITS SHALL HAVE A NYLON "FISH TAPE" LEFT IN THEM.

ALL WALL AND FLOOR PENETRATIONS SHALL BE FIRE RATED TO MAINTAIN RATING OF SURFACE PENETRATED, OR 1 HOUR RATING MINIMUM, SEALING SHALL BE WITH 3M #CP25 FIRE PUTTY OR EQUAL BY NELSON.

CONTROL STATIONS CONTROL STATIONS CONTROL STATIONS CONTROL STATIONS FOR GENERATOR EMERGENCY STOP SHALL INCLUDE MAINTAINED CONTACT PUSH-PULL MUSHROOM HEAD PUSHBUTTON IN A BREAK-GLASS TYPE CAST ALUMINUM ENCLOSURE.

OUTLET BOXES
ALL FLUSH MOUNTED OUTLET BOXES SHALL BE STANDARD GALVANIZED STEEL TYPE NOT LESS THAN 1-1/2" DEEP, OF TYPE AND SIZE TO ACCOMMODATE DEVICES SPECIFIED WITH PROPER SPACE FOR WIRE AND SUPPORTS. BOXES SHALL BE EQUIPPED WITH PLASTER RINGS OR COVERS AS REQUIRED.

ALL OUTLET BOXES, PULL BOXES AND JUNCTION BOXES SHALL BE RIGIDLY SECURED IN PLACE IN AN APPROVED METHOD. NO OUTLETS SHALL BE PLACED BEHIND MECHANICAL PIPES OR HEATING EQUIPMENT OR ENCLOSURES. CHECK DRAWNIGS OF OTHER TRADES FOR DOOR SWINIGS AND SIZES AND LOCATIONS OF EQUIPMENT AND CASINETS.

INSTALATION OF CABLES
BEFORE COMBUSTORS ARE INSTALLED IN CONDUST RUNS, THE CONDUSTS SHALL BE SWABBED OR THE
EQUIVALENT TO RISURE THEIR DRYNESS AND FREEDOM FROM FOREIGN MATTER DETRIMENTAL TO THE
CONDUCTOR INSULATION, ALL WIRING SHALL BE INSTALLED BEFORE FRISHES ARE APPLIED TO WALL AND

MIRE AND CABLES
ALL WIRE AND CABLE SHALL CONFORM TO THE LATEST REQUIREMENTS OF THE CURRENT EDITION OF THE NEC AND SHALL MEET ALL ASTM SPECIFICATIONS. WIRE AND CABLE SHALL BE NEW, SHALL HAVE SIZE, GRADE OF INSULATION, VOLTAGE AND MANUFACTURERS NAME PERMANENTLY MARGED ON OUTSET COVERING AT REGULAR INTERVALS, SHALL BE DELIVERED IN CONFECT SOME OFFICE OF THE DETITION SIZE AND

WIRE AND CABLE SHALL BE SUITABLY PROTECTED FROM WEATHER AND DAMAGE DURING STORAGE AND HANDLING AND SHALL BE IN FIRST-CLASS CONDITION WHEN INSTALLED.

ALL CONDUCTORS SHALL BE STRANDED, SOFT-DRAWN COPPER UNLESS OTHERWISE NOTED.

ALL WIRING SHALL BE THHN, THWN, OR XHHW UNLESS A HIGHER TEMPERATURE WIRE IS REQUIRED TO FEED LIGHTING FIXTURES. HIGH TEMPERATURE CUTOUTS, ETC.

WIRE AND CABLE SHALL BE AS MANUFACTURED BY SOUTHWIRE GENERAL CABLE OKONITE OR ANACONDA

MINIMUM SIZE WIRE SHALL BE #12 AWG UNLESS OTHERWISE NOTED.

PROVIDE A SEPARATE NEUTRAL CONDUCTOR FOR EACH CIRCUIT.

WIRE CONNECTIONS
SPLICES IN CONDUCTORS NO. 8 AND SMALLER SHALL BE MADE BY PREINSULATED "SCOTCHLOCK" OR IDEAL
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SPLICES IN CONDUCTORS NO. 8 AND SMALLER SHALL BY THE SPLICES OF THE STATEMENT OF THE STATEME "WING-NUT" SPRING TENSION CONNECTORS, INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS, SPLICES OF NO, SCOUDLETORS AND LARGER SHALL BE MADE WITH SOLDERLESS, COMPRESSION TYPE CONNECTORS, UL LABLEED NO COMPRESSED WITH APPROVED TOOLS ALL SPLICES SHALL BE INSULATED WITH AN APPROVED VINYL PLASTIC ALL WEATHER TAPE TO A THICKNESS EQUIVALENT

GROUNDING
ALL CABINETS, CONDUIT SYSTEMS, PANELBOARDS, ETC., SHALL BE THOROUGHLY GROUNDED IN ACCORDANCE
WITH THE REGUIREMENTS OF THE NATIONAL ELECTRICAL CODE. PROVIDE A SEPARATE GROUND WIRE IN EACH
RACEWAY.

WIRING DEVICES
GROUND-FAULT CIRCUIT INTERRUPTER RECEPTACLES: UL 943, FEED-THROUGH TYPE, WITH INTEGRAL NEMA
5-20R DUPLEX RECEPTACLE; FOR INSTALLATION IN A 2 34 INCH DEEP DUTLET BOX WITHOUT AN ADAPTER.

PANELBOARDS

CIRCUIT BREAKERS FOR INSTALLATION IN EXISTING PANELBOARDS SHALL BE MOLDED PLASTIC CASE TYPE, AC RATED, BOLT ON, QUICK-MAKE, QUICK-BREAK, WITH TRIP FREE COMMON OPERATING HANDLE, POSITION INDICATION, AND COMMON TRIP FOR 2 AND 3 POLE CIRCUIT BREAKERS FROM INTERNAL-MAGNETIC TRIP DEVICE. TRIP PARTIMOS AND INJURIED OF POLES SHALL BE AS INDICATED ON THE DRAWINGS AND INJURIED. INTERRUPTING CAPACITY SHALL BE 10 000 SYMMETRICAL AMPERES AT 120/240 VOLTS

UPDATE PANELBOARD DIRECTORIES NEW LOADS SUPPLIED BY EACH BRANCH CIRCUIT IN THE PANEL. THE REQUIRED INFORMATION SHALL BE NEATLY TYPEWRITTEN ON DIRECTORIES IN EACH PANEL CIRCUIT.

AUTOMATIC TRANSFER SWITCH
PROVIDE ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES; LISTED AND LABELED AS DEFINED IN

NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION

COMPLY WITH NEMA ICS 1 COMPLY WITH NFPA 110.

COMPLY WITH UL 1008 UNLESS REQUIREMENTS OF THESE SPECIFICATIONS ARE STRICTER.

INDICATED CURRENT RATINGS: APPLY AS DEFINED IN UL 1008 FOR CONTINUOUS LOADING AND TOTAL SYSTEM. TRANSFER, INCLUDING TUNGSTEN PILAMENT LAMP LOADS NOT EXCEEDING 30 PERCENT OF SWITCH AMPERE RATING, LINLESS OTHERWISE INCICATED.

TESTED FAULT-CURRENT CLOSING AND SHORT-CIRCUIT RATINGS: ADEQUATE FOR DUTY IMPOSED BY PROTECTIVE DEVICES AT INSTALLATION LOCATIONS IN PROJECT UNDER THE FAULT CONDITIONS INDICATED BASED ON TESTING ACCORDING TO UL 1008

SHORT-TIME WITHSTAND CAPABILITY FOR 30 CYCLES,

ELECTRICAL OPERATION: ACCOMPLISH BY A NONFUSED, MOMENTARILY ENERGIZED SOLENOID OR ELECTRIC-MOTOR-OPERATED MECHANISM. SWITCHES FOR EMERGENCY OR STANDBY PURPOSES SHALL BE MECHANICALLY AND LECTRICALLY INTERLOCKED IN BOTH DIRECTIONS TO PREVENT SIMULTANEOUS CONNECTION TO BOTH POWER SOURCES DIVILES CLOSED TRANSITION.

ENCLOSURES. GENERAL-PURPOSE NEMA 250, TYPE 1, COMPLYING WITH NEMA ICS 6 AND UL 508, UNLESS

SWITCH ACTION: DOUBLE THROW: MECHANICALLY HELD IN BOTH DIRECTIONS.

UNDERVOLTAGE SENSING FOR EACH PHASE OF NORMAL SOURCE: SENSE LOW PHASE-TO-GROUND VOLTAGE ON EACH PHASE. PICKUP VOLTAGE SHALL BE ADJUSTABLE FROM 85 TO 100 PERCENT OF NOMINAL, AND DROPOUT VOLTAGE SHALL BE ADJUSTABLE FROM 75 TO 58 PERCENT OF PICKUP VALUE, FACTORY SET FOR PICKUP AT 90 PERCENT AND DROPOUT AT 85 PERCENT.

VOLTAGE/FREQUENCY LOCKOUT RELAY: PREVENT PREMATURE TRANSFER TO GENERATOR, PICKUP VOLTAGE SHALL BE ADJUSTABLE FROM 85 TO 100 PERCENT OF NOMINAL. FACTORY SET FOR PICKUP AT 30 PERCENT PROCUP PROCEDORY SHALL BE ADJUSTABLE FROM 30 TO 100 PERCENT OF NOMINAL, FACTORY SET OF PICKUP PROCUP.

TIME DELAY FOR RETRANSFER TO NORMAL SOURCE: ADJUSTABLE FROM ZERO TO 30 MINUTES, AND FACTORY SET FOR 10 MINUTES. OVERRIDE SHALL AUTOMATICALLY DEFEAT DELAY ON LOSS OF VOLTAGE OR SUSTAINED UNDERVOLTAGE OF EMERGENCY SOURCE, PROVIDED ROMANS, SUPPLY HAS BEEN RESTORED.

TEST SWITCH: SIMULATE NORMAL-SOURCE FAILURE.

SWITCH-POSITION PILOT LIGHTS: INDICATE SOURCE TO WHICH LOAD IS CONNECTED. SOURCE-AVAILABLE INDICATING LIGHTS. SUPERVISE SOURCES VIA TRANSFER-SWITCH NORMAL- AND EMERGENCY-SOURCE SENSING CIRCUITS.

UNASSIGNED AUXILIARY CONTACTS: TWO NORMALLY OPEN, SINGLE-POLE, DOUBLE-THROW CONTACTS FOR EACH SWITCH POSITION, RATED 10 A AT 240-V AC.

TRANSFER OVERRIDE SWITCH: OVERRIDES AUTOMATIC RETRANSFER CONTROL SO TRANSFER SWITCH WILL REMAIN CONNECTED TO EMERGENCY POWER SOURCE REGARDLESS OF CONDITION OF NORMAL SOURCE. PLOY LIGHT MIDDLATES OVERRIDE STATUS,

ENGINE SHUTDOWN CONTACTS: INSTANTANEOUS: SHALL INITIATE SHUTDOWN SEQUENCE AT REMOTE ENGINE-GENERATOR CONTROLS AFTER RETRANSFER OF LOAD TO NORMAL SOURCE

ENGINE SHUTDOWN CONTACTS: TIME DELAY ADJUSTABLE FROM ZERO TO FIVE MINUTES, AND FACTORY SET FOR FIVE MINUTES, CONTACTS SHALL INITIATE SHUTDOWN AT REMOTE ENGINE-GENERATOR CONTROLS AFTER RETRANSFER OF LOAD TO NORMAL SOURCE.

ENGINE-GENERATOR EXERCISER: SOLID-STATE, PROGRAMMAGLE-TIME SWITCH STATTS ENGINE GENERATOR AND TRANSFERS LOAD TO IT FROM NORMAL SOURCE FOR A PRESET TIME. THEN RETRANSFERS AND SHUTS DOWN ENGINE AFTER A PRESET COOL-DOWN PERIOD, INTITATE SERGEISE CYCLE, ZAMERO ATTER A PRESET INTERVALS ADJUSTABLE FROM 7 TO 30 DAYS. RUNNING PERIODS SHALL BE ADJUSTABLE FROM 10 TO 30 MINUTES, FACTORY SETTIMES SHALL BE FOR 7-20/Y EXPECTED EX CYCLE, ZAMBULTE RUNNING PERIOD, AND S-MINUTE COOL-DOWN PERIOD. EXERCISER FEATURES INCLUDE THE FOLLOWING:

- 1. EXERCISER TRANSFER SELECTOR SWITCH: PERMITS SELECTION OF EXERCISE WITH AND WITHOUT LOAD
- 2. PUSH-BUTTON PROGRAMMING CONTROL WITH DIGITAL DISPLAY OF SETTINGS.
- 3. INTEGRAL BATTERY OPERATION OF TIME SWITCH WHEN NORMAL CONTROL POWER IS

COMPLY WITH LEVEL 1 EQUIPMENT ACCORDING TO NEPA 110.

FACTORY TESTS. TEST AND INSPECT COMPONENTS, ASSEMBLED SWITCHES, AND ASSOCIATED EQUIPMENT ACCORDING TO UL 1008. ENSURE PROPER OPERATION. CHECK TRANSFER TIME AND VOLTAGE, FREQUENCY, AND TIME-DELAY SETTINGS FOR COMPLANCE WITH SPECIFIED REQUIREMENTS. PERFORM DIELECTRIC STRENGTH TEST COMPLYING WITH NEWA ICS 1.

SURFACE MOUNT TRANSFER SWITCH LEVEL AND PLUMB WHERE INDICATED

REMOTE ANNUNCIATOR AND CONTROL PANEL MOUNTING: SURFACE MOUNTED WHERE INDICATED. SET FIELD-ADJUSTABLE INTERVALS AND DELAYS, RELAYS, AND ENGINE EXERCISER CLOCK.

PERFORM THE ACCEPTANCE TESTS AND INSPECTIONS PER NFPA 110 AND NETA STANDARD FOR ACCEPTANCE TESTS, WITH THE ASSISTANCE OF A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE:

SIMULATE POWER FAILURES OF NORMAL SOURCE TO AUTOMATIC TRANSFER SWITCHES AND RETRANSFER FROM EMERGENCY SOURCE WITH NORMAL SOURCE AVAILABLE.

SIMULATE LOSS OF PHASE-TO-GROUND VOLTAGE FOR EACH PHASE OF NORMAL SOLINCE

VERIFY TIME-DELAY SETTINGS.

VERIFY PICKUP AND DROPOUT VOLTAGES BY DATA READOUT OR INSPECTION OF CONTROL SETTINGS.

VERIFY PROPER SEQUENCE AND CORRECT TIMING OF AUTOMATIC ENGINE STARTING, TRANSFER TIME DELAY, RETRANSFER TIME DELAY ON RESTORATION OF NORMAL POWER, AND ENGINE COOL-DOWN AND

GROUND-FAULT TESTS: COORDINATE WITH TESTING OF GROUND-FAULT PROTECTIVE DEVICES FOR POWER DELIVERY FROM BOTH SOLURGES

VERIFY GROUNDING CONNECTIONS AND LOCATIONS AND RATINGS OF SENSORS.

COORDINATE TESTS WITH TESTS OF GENERATOR AND RUN THEM CONCURRENTLY

ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN TRANSFER SWITCHES AND RELATED EQUIPMENT.

NATURAL GAS ENGINE GENERATOR

SUBMITTALS, SUBMIT PRODUCT DATA AND SHOP DRAWINGS

INCLUDE PLANS AND ELEVATIONS FOR ENGINE GENERATOR AND OTHER COMPONENTS SPECIFIED. INCLUDE DETAILS OF EQUIPMENT ASSEMBLIES. INDICATE DIMENSIONS, WEIGHTS, LOADS, REQUIRED CLEARANCES, METHOD OF FIELD ASSEMBLY, COMPONENTS, AND LOCATION AND SIZE OF EACH FIELD CONNECTION.

IDENTIFY FLUID DRAIN PORTS AND CLEARANCE REQUIREMENTS FOR PROPER FLUID DRAIN.

DESIGN CALCULATIONS FOR SELECTING VIRRATION ISOLATORS AND SEISMIC RESTRAINTS AND FOR

VIBRATION ISOLATION BASE DETAILS: DETAIL FABRICATION, INCLUDING ANCHORAGES AND ATTACHMENTS TO STRUCTURE AND SUPPORTED EQUIPMENT. INCLUDE BASE WEIGHTS. INCLUDE DIAGRAMS FOR POWER, SIGNAL, AND CONTROL WIRING. COMPLETE SCHEMATIC, WIRING, AND INTERCONNECTION DIAGRAMS SHOWING TERMINAL MARKINGS FOR EPS EQUIPMENT AND FUNCTIONAL RELATIONSHIP BETWEEN ALL ELECTRICAL COMPONENTS.

SUBMIT OPERATION AND MAINTENANCE DATA WITH EQUIPMENT UPON DELIVE

PROVIDE MANUFACTURER'S WARRANTY TO REPAIR OR REPLACE COMPONENTS OF PACKAGED ENGINE GENERATORS AND ASSOCIATED AUXILIARY COMPONENTS THAT FAIL IN MATERIALS OR WORKMANSHIP ONE (1) YEAR FROM DATE OF SUBSTANTIAL COMPLETION.

EQUIPMENT AS MANUFACTURED BY GENERAC FORMS THE BASIS OF DESIGN. OTHER ACCEPTABLE MANUFACTURERS INCLUDE KOHLER, CUMMINS, MTU, AND CATERPILLAR

COMPLY WITH NFPA 37. COMPLY WITH NEPA 70.

COMPLY WITH NFPA 110 REQUIREMENTS FOR LEVEL 1 EPSS.

COMPLY WITH UL 2200. COMPLY WITH EPA TIER 2 REQUIREMENTS FOR ENGINE EXHAUST EMISSIONS, AND APPLICABLE STATE AND

ENGINE GENERATOR SHALL BE FACTORY-ASSEMBLED AND -TESTED, WATER-COOLED ENGINE, WITH BRUSHLESS GENERATOR AND ACCESSORIES. ALL ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES. SHALL BE LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND USE.

ENGINE GENERATOR SHALL BE RATED 200KW, 0.8 POWER FACTOR (LAGGING), 208Y/120V, 60 HZ, THREE PHASE, FOUR-WIRE, WYE WITH NATURALLY ASPIRATED ENGINE AND ISOCHRONOUS GOVERNOR, WITH SPEED SENSING.

MOUNTING FRAME: STRUCTURAL-STEEL FRAMEWORK TO MAINTAIN ALIGNMENT OF MOUNTED COMPONENTS WITHOUT DEPENDING ROOF CURB SUPPORTS, PROVIDE LIFTING ATTACHMENTS SIZED AND SPACED TO PREVENT DEFLECTION OF BASE DURING LIFTING MOWING.

PROVIDE RIGGING DIAGRAM: INSCRIBED ON METAL PLATE PERMANENTLY ATTACHED TO MOUNTING FRAME TO INDICATE LOCATION AND LIFTING CAPACITY OF EACH LIFTING ATTACHMENT AND ENGINE GENERATOR CENTER OF GRANTIY.

STEADY-STATE VOLTAGE OPERATIONAL BANDWIDTH: 3 PERCENT OF RATED OUTPUT VOLTAGE, FROM NO

TRANSIENT VOLTAGE PERFORMANCE. NOT MORE THAN 20 PERCENT VARIATION FOR 50 PERCENT STEP-LOAD INCREASE OR DECREASE. VOLTAGE SHALL RECOVER AND REMAIN WITHIN THE STEADY-STATE OPERATING BAND WITHIN THREE SECOND.

STEADY-STATE FREQUENCY OPERATIONAL BANDWIDTH: 0.5 PERCENT OF RATED FREQUENCY, FROM NO

STEADY-STATE FREQUENCY STABILITY: WHEN SYSTEM IS OPERATING AT ANY CONSTANT LOAD WITHIN THE RATEL LOAD, THERE SHALL BE NO RANDOM SPEED VARIATIONS OUTSIDE THE STEADY-STATE OPERATIONAL BAND AND NO HOUSTROG PS USEROM 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 OUTPUT WAVEFORM: AT NO LOAD, HARMONIC CONTENT MEASURED LINE TO LINE OR LINE TO NEUTRAL

SHALL NOT EXCEED 5 PERCENT TOTAL AND 3 PERCENT FOR SINGLE HARMONICS, TELEPHONE INFLUENCE FACTOR, DETERMINED ACCORDING TO NEMA MG 1, SHALL NOT EXCEED 50 PERCENT, SUSTAINED SHORT-CIRCUIT CURRENT: FOR A THREE-PHASE, BOLTED SHORT CIRCUIT AT 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

START TIME: COMPLY WITH NFPA 110, TYPE 10, SYSTEM REQUIREMENTS.

# DiClemente Siegel Design

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CITY OF ANN ARBOR FIRE STATION #1 GENERATOR ANN ARBOR, MICHIGAN

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WHER REVIEW 09/21/17 100% REVIEW 09/21/17 19/06/17

DESIGNER: JCO DRAWN DA PRINC JSKSV CHECKED SM ACADFILE 17-1304-5-6 PROJECT No. 17-1304 E-5

ENGINE

FUEL. NATURAL GAS.

RATED ENGINE SPEED: 1800 RPM

LUBRICATION SYSTEM. ENGINE OR SKID MOUNTED.

JACKET COGLANT HEATER: ELECTRIC-IMMERSION TYPE, FACTORY INSTALLED IN COGLANT JACKET SYSTEM. COMPLY WITH NFPA 110 REQUIREMENTS FOR LEVEL 1 EQUIPMENT FOR HEATER CAPACITY AND WITH UL 499.

COOLING SYSTEM: CLOSED LOOP, LIQUID COOLED, WITH RADIATOR FACTORY MOUNTED ON ENGINE GENERATOR MOUNTING FRAME AND INTEGRAL ENGINE-DRIVEN COOLANT PUMP.

1. COOLANT: SOLUTION OF 50 PERCENT ETHYLENE-GLYCOL-BASED ANTIFREEZE AND 50 PERCENT WATER, WITH ANTICORROSION ADDITIVES AS RECOMMENDED BY ENGINE MANUFACTURER.

MUFFLER/SILENCER. CRITICAL TYPE, SIZED AS RECOMMENDED BY ENDINE MANUFACTURER AND SELECTED WITH EXHALIST PIPMIG SYSTEM TO NOT EXCEED ENGINE MANUFACTURER'S ENGINE BACKPRESSURE REQUIREMENTS.

MINIMUM SOUND ATTENUATION OF 25 DB AT 500 HZ.

SOUND LEVEL MEASURED AT A DISTANCE OF 25 FEET FROM EXHAUST DISCHARGE AFTER INSTALLATION IS COMPLETE SHALL BE 78 DBA OR LESS.

AIR-INTAKE FILTER: HEAVY-DUTY, ENGINE-MOUNTED AIR CLEANER WITH REPLACEABLE DRY-FILTER ELEMENT AND "BLOCKED FILTER" INDICATOR.

STARTING SYSTEM: 24-V ELECTRIC, WITH NEGATIVE GROUND.

COMPONENTS: SIZED SO THEY ARE NOT DAMAGED DURING A FULL ENGINE-CRANKING CYCLE, WITH

CRANKING CYCLE: AS RECHIRED BY NEPA 110 FOR SYSTEM LEVEL SPECIFIED.

BATTERY: SEALED LEAD CALCIUM AGM TYPE WITH CAPACITY WITHIN AMBIENT TEMPERATURE RANGE SPECIFIED IN "PERFORMANCE REQUIREMENTS" ATTICLE TO PROVIDE SPECIFIED CRANKING CYCLE AT LEAST THREE TIMES WITHOUT RECHARGING.

BATTERY-CHARGING ALTERNATOR: FACTORY MOUNTED ON ENGINE WITH SOLID-STATE VOLTAGE REGULATION AND 35-A MINIMUM CONTINUOUS RATING.

UNIT-MOUNTED BATTERY CHARGER: CURRENT-LIMITING AUTOMATIC-FOUALIZING AND FLOAT-CHARGING TYPE DESIGNED FOR LEAD CALCIUM AGM] BATTERIES, UNIT SHALL COMPLY WITH UL 1236 AND INCLUDE THE FOLLOWING FEATURES:

1. AMMETER AND VOLTMETER: FLUSH MOUNTED IN DOOR, METERS SHALL INDICATE CHARGING RATES.

2 SAFETY FUNCTIONS: SENSE ABNORMALLY LOW BATTERY VOLTAGE AND CLOSE CONTACTS PROVIDING LOW BATTERY VOLTAGE INDICATION ON CONTROL AND MONITORING PANEL. SENSE HIGH BATTERY VOLTAGE AND LOSS OF P.C. INPUTO RD COUPIET OF BATTERY CHARGER. EITHER CONDITION SHALL CLOSE CONTACTS THAT PROVIDE A BATTERY-CHARGER MALFUNCTION INDICATION AT SYSTEM

GASEOUS FUEL SYSTEM.- GAS TRAIN: COMPLY WITH NFPA 37.

ENGINE FUEL SYSTEM:- NATURAL GAS, -WITH SECONDARY GAS REGULATOR AND NRTL-LISTED, NOBMALLY CLOSED FUEL-SAFETY SHUTOFF SOLENDID VALVE, FUEL FILTER, MANUAL FUEL SHUTOFF VALVE, AND FLEXIBLE FUEL CONNECTION.

CONTROL AND MONITORING

AUTOMATIC STARTING SMOREM SEQUENCE OF OPERATION WHEN MODE-SELECTOR SWITCH ON THE AUTOMATIC STARTING SWIFTEM SEQUENCE OF OPERATION WHEN MODES-SELECTORS SWIFTED MIXTCH ON THE CONTROL AND MONITORING PANEL IS IN THE AUTOMATIC POSITION, REMOTE-CONTROL CONTROLS IN ONE OR MORE SEPARATE AUTOMATIC TRANSFER SWITCHES INITIATE STARTING AND STOPPING OF ENGINE GENERATOR, WHEN MODE-SELECTOR SWITCH IS SWITCHED TO THE ON POSITION, ENGINE GENERATOR STARTS. THE OFF POSITION OF SAME SWITCH INITIATES ENGINE GENERATOR SHUTDOWN, WHEN ENGINE GENERATOR BY RUNNING, SPECIFIED SYSTEM OR EQUIPMENT FAILURES OR DERANGEMENTS AUTOMATICALLY SHUT DOWN ENGINE GENERATOR AND INITIATE ALARMS.

MANUAL STARTING SYSTEM SEQUENCE OF OPERATION: SWITCHING ON-OFF SWITCH ON THE GENERATOR CONTROL PANEL TO THE ON POSITION STARTS ENGINE GENERATOR, THE OFF POSITION OF SAME SWITCH INITIATES ENGINE GENERATOR SHUTDOWN. WHEN ENGINE GENERATOR IS RUNNING, SPECIFIED SYSTEM OR EQUIPMENT FAILURES OR DERANGEMENTS AUTOMATICALLY SHUT DOWN ENGINE GENERATOR AND INITIATE

PROVIDE MINIMUM RUN-TIME CONTROL SET FOR 30 MINUTES, WITH OVERRIDE ONLY BY OPERATION OF A REMOTE EMERGENCY-STOP SWITCH.

CONFIGURATION: OPERATING AND SAFETY INDICATIONS, PROTECTIVE DEVICES, BASIC SYSTEM CONTROLS, CONTRIBUTION OF SHALL BE GROUPED IN A COMMON CONTROL AND MONITORING PAREL MOUNTED ON THE ENGINE GENERATOR, MOUNTING METHOD SHALL ISOLATE THE CONTROL PAREL FROM ENGINE GENERATOR. MOUNTING METHOD SHALL ISOLATE THE CONTROL PAREL FROM ENGINE GENERATOR WIREATOR. PAREL SHALL BE POWERED FROM THE ENGINE GENERATOR ATTERY.

CONTROL AND MONITORING PANEL.

DIGITAL CONTROLLER WITH INTEGRATED LCD DISPLAY, CONTROLS, AND MICROPROCESSOR, CAPABLE OF LOCAL AND REMOTE CONTROL, MONITORING, AND PROGRAMMING, WITH BATTERY BACKUP.

INSTRUMENTS: LOCATED ON THE CONTROL AND MONITORING PANEL AND VIEWABLE DURING OPERATION.

2 ENGINE-COOLANT TEMPERATURE GAGE.

DC VOLTMETER (ALTERNATOR BATTERY CHARGING)

4 RUNNING-TIME METER.

5 AC VOLTMETER, [FOR EACH PHASE] [CONNECTED TO A PHASE SELECTOR SWITCH].

6 AC AMMETER, IFOR EACH PHASE ICONNECTED TO A PHASE SELECTOR SWITCHI.

AC FREQUENCY METER.

8 GENERATOR-VOLTAGE ADJUSTING RHEOSTAT.

9 CONTROLS AND PROTECTIVE DEVICES: CONTROLS, SHUTDOWN DEVICES, AND COMMON VISUAL ALARM

INDICATION AS REQUIRED BY NFPA 110 FOR LEVEL 1 SYSTEM, INCLUDING THE FOLLOWING:

5. CRANKING CONTROL EQUIPMENT

3 CONTROL SWITCH NOT IN AUTOMATIC POSITION ALARM.

5 OVERCRANK SHUTDOWN DEVICE.

LOW WATER TEMPERATURE ALARM

7. HIGH ENGINE TEMPERATURE PRE-ALARM. 8 HIGH ENGINE TEMPERATURE

9 HIGH ENGINE TEMPERATURE SHUTDOWN DEVICE.

10. OVERSPEED ALARM. 11. OVERSPEED SHUTDOWN DEVICE.

12. COOLANT LOW-LEVEL ALARM.

13. COOLANT LOW-LEVEL SHUTDOWN DEVICE.

14. BATTERY HIGH-VOLTAGE ALARM.

15. LOW-CRANKING VOLTAGE ALARM. 16 RATTERY-CHARGER MAI FUNCTION ALARM

17. BATTERY LOW-VOLTAGE ALARM.

18. LAMP TEST. 19. CONTACTS FOR LOCAL AND REMOTE COMMON ALARM.

20. REMOTE MANUAL-STOP SHUTDOWN DEVICE.

21. GENERATOR OVERCURRENT-PROTECTIVE-DEVICE NOT-CLOSED ALARM.

22. COMMON REMOTE PANEL WITH COMMON AUDIBLE ALARM: COMPLY WITH NEPA 110 REQUIREMENTS FOR

INCLUDE NECESSARY CONTACTS AND TERMINALS IN CONTROL AND MONITORING PANEL REMOTE PANEL SHALL BE POWERED FROM THE ENGINE GENERATOR BATTERY.

SUPPORTING ITEMS: INCLUDE SENSORS, TRANSDUCERS, TERMINALS, RELAYS, AND OTHER DEVICES AND INCLUDE WIRING REQUIRED TO SUPPORT SPECIFIED ITEMS. LOCATE SENSORS AND OTHER SUPPORTING ITEMS ON BEINE OR GENERATOR UNLESS OTHERWISE BINDCATE.

OVERCURRENT PROTECTIVE DEVICES FOR THE ENTIRE EPSS SHALL BE COORDINATED TO OPTIMIZE SELECTIVE TRIPPING WHEN A SHORT CIRCUIT OCCURS, COORDINATION OF PROTECTIVE DEVICES SHALL CONSIDER BOTH UTILITY AND EPSS AS THE VOLTAGE SOURCE.

OVERCURRENT PROTECTIVE DEVICES FOR THE EPSS SHALL BE ACCESSIBLE ONLY TO AUTHORIZED

GENERATOR CIRCUIT BREAKER: MOLDED-CASE, ELECTRONIC-TRIP TYPE; 100 PERCENT RATED; COMPLYING WITH UL 489.

TRIPPING CHARACTERISTICS: ADJUSTABLE LONG-TIME AND SHORT-TIME DELAY AND INSTANTANEOUS

TRIP SETTINGS: SELECTED TO COORDINATE WITH GENERATOR THERMAL DAMAGE CURVE.

SHUNT TRIP: CONNECTED TO TRIP BREAKER WHEN ENGINE GENERATOR IS SHUT DOWN BY OTHER

MOUNTING: ADJACENT TO OR INTEGRATED WITH CONTROL AND MONITORING PANEL

GROUND-FAULT INDICATION: COMPLY WITH NFPA 70 ARTICLE 700, "EMERGENCY SYSTEM" SIGNALS FOR GROUND FAULT.

INDICATE GROUND FAULT WITH OTHER ENGINE GENERATOR ALARM INDICATIONS.

TRIP GENERATOR PROTECTIVE DEVICE ON GROUND FAULT,

GENERATOR, EXCITER, AND VOLTAGE REGULATOR

COMPLY WITH NEMA MG 1.

DRIVE: GENERATOR SHAFT SHALL BE DIRECTLY CONNECTED TO ENGINE SHAFT, EXCITER SHALL BE ROTATED INTEGRALLY WITH GENERATOR ROTOR.

ELECTRICAL INSULATION: CLASS H.

CONSTRUCTION SHALL PREVENT MECHANICAL, ELECTRICAL, AND THERMAL DAMAGE DUE TO VIBRATION, OVERSPEED UP TO 125 PERCENT OF RATING, AND HEAT DURING OPERATION AT 110 PERCENT OF RATED CAPACITY.

VOLTAGE REGULATOR: SOLID-STATE TYPE, SEPARATE FROM EXCITER, PROVIDING PERFORMANCE AS

ADJUSTING RHEOSTAT ON CONTROL AND MONITORING PANEL: PROVIDE PLUS OR MINUS 5 PERCENT ADJUSTMENT OF OUTPUT-VOLTAGE OPERATING BAND.

2. MAINTAIN VOLTAGE WITHIN 15 PERCENT ON ONE STEP, FULL LOAD.

3. PROVIDE ANTI-HUNT PROVISION TO STABILIZE VOLTAGE.

4. MAINTAIN FREQUENCY WITHIN 5 PERCENT AND STABILIZE AT RATED FREQUENCY WITHIN TWO SECONDS.

STRIP HEATER: THERMOSTATICALLY CONTROLLED UNIT ARRANGED TO MAINTAIN STATOR WINDINGS ABOVE

WINDINGS: TWO-THIRDS PITCH STATOR WINDING AND FULLY LINKED AMORTISSEUR WINDING.

SUBTRANSIENT REACTANCE: 12 PERCENT, MAXIMUM.

VIBRATION ISOLATION DEVICES

ELASTOMERIC ISOLATOR PADS. OIL- AND WATER-RESISTANT ELASTOMER OR NATURAL RUBBER, ARRANGED IN SINGLE OR MULTIPLE LAYERS, MCLIED WITH A NONSUP PATTERN AND GALVANIZED-STEEL BASEPLATES OF SUFFICIENT STIFFNESS FOR UNIFORM LOADING OVER PAD AREA, AND FACTORY CUT TO SIZES THAT MATCH REQUIREMENTS OF SUPPORTED EQUIPMENT.

1. MATERIAL: STANDARD NEOPRENE SEPARATED BY STEEL SHIMS

INSTALLATION

INTERRUPTION OF EXISTING ELECTRICAL SERVICE: DO NOT INTERRUPT ELECTRICAL SERVICE TO FACILITIES OCCUPIED BY OWNER OR OTHERS UNLESS PERMITTED UNDER THE FOLLOWING CONDITIONS AND THEN ONLY AFTER ARRANGING TO PROVIDE TEMPORARY ELECTRICAL SERVICE ACCORDING TO REQUIREMENTS INDICATED.

1. NOTIFY OWNER NO FEWER THAN TWO WORKING DAYS IN ADVANCE OF PROPOSED INTERRUPTION OF

2. DO NOT PROCEED WITH INTERRUPTION OF ELECTRICAL SERVICE WITHOUT OWNER'S WRITTEN PERMISSION

COMPLY WITH NECA 1 AND NECA 484.

FISH DIGHALITY CONTROL

COMPLY WITH PACKAGED ENGINE GENERATOR MANUFACTURERS' WRITTEN INSTALLATION AND ALIGNMENT INSTRUCTIONS AND WITH NFPA 110.

ENGAGE A QUALIFIED TESTING AGENCY TO PERFORM TESTS AND INSPECTIONS. PERFORM TESTS AND INSPECTIONS WITH THE ASSISTANCE OF A FACTORY-AUTHORIZED SERVICE

PERFORM TESTS RECOMMENDED BY MANUFACTURER AND EACH VISUAL AND MECHANICAL INSPECTION AND ELECTRICAL AND MECHANICAL TEST AS SPECIFIED IN NETA ATS, CERTIFY COMPLIANCE WITH TEST

NFPA 110 ACCEPTANCE TESTS. PERFORM TESTS REQUIRED BY NFPA 110 THAT ARE ADDITIONAL TO THOSE SPECIFIED HERE INCLUDING, BUT NOT LIMITED TO, SINGLE-STEP FULL-LOAD PICKUP TEST. PROVIDE A LOAD BANK FOR FULL LOAD TEST.

BATTERY-CHARGER TESTS: VERIFY SPECIFIED RATES OF CHARGE FOR BOTH EQUALIZING AND FLOAT-CHARGING CONDITIONS

SYSTEM INTEGRITY TESTS: METHODICALLY VERIFY PROPER INSTALLATION, CONNECTION, AND INTEGRITY OF EACH ELEMENT OF ENGINE GENERATOR SYSTEM BEFORE AND DURING SYSTEM OPERATION. CHECK FOR ARR, EXCHALLS, TWO FLUID LEAVE.

COORDINATE TESTS WITH TESTS FOR TRANSFER SWITCHES AND RUN THEM CONCURRENTLY.

OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER MOTOR ROTATION AND UNIT OPERATION FOR GENERATOR AND ASSOCIATED EQUIPMENT.

TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND

ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN PACKAGED ENGINE GENERATORS.



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CITY OF ANN ARBOR FIRE STATION #1 **GENERATOR** ANN ARBOR, MICHIGAN

> ELECTRICAL **SPECIFICATIONS**

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OWNER REVIEW	99/21/17
100% REVIEW	09/21/17
BIDS	10/06/17

	E-6
PROJECT No.	17-1304
ACADFILE	17-1304-5-6
CHECKED.	SM
PM / PIC	JSRVSM
DRAWN	DA
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