

WAYNE STATE UNIVERSITY ELECTRICAL RELIABILITY UPGRADE

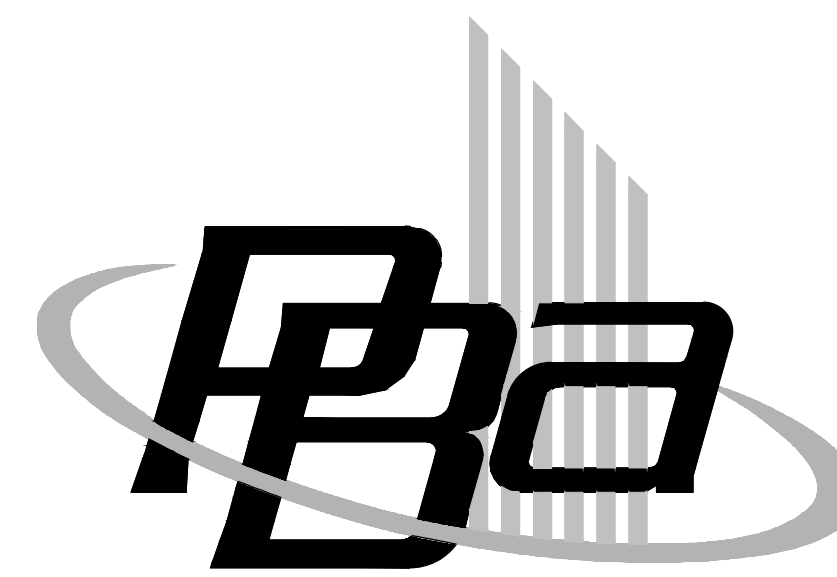
603 - COLLEGE OF PHARMACY
259 MACK AVENUE, DETROIT, MICHIGAN 48202
WSU PROJECT NO: 603-243264

BIDS 08/26/2014

**WAYNE STATE
UNIVERSITY**

Facilities Planning & Management
Design & Construction Services
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Detroit MI 48202

WSU PROJECT NO: 603-243264



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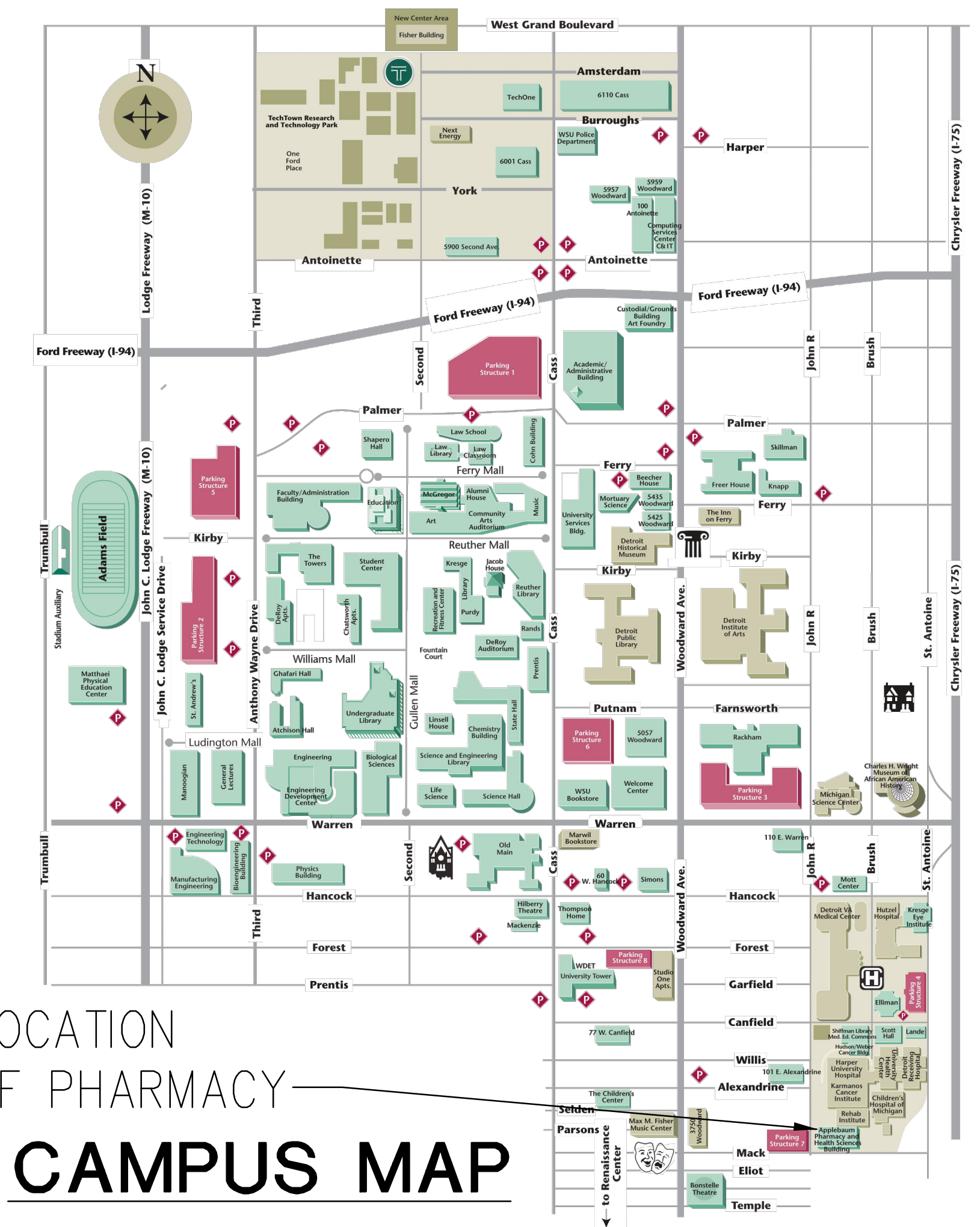
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PBA PROJECT NO: 2014.0097



PROJECT LOCATION
COLLEGE OF PHARMACY

CAMPUS MAP

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C6.1	GRADING PLAN
C8.1	SITE DETAILS

STRUCTURAL DRAWING INDEX

SHEET NO.	SHEET TITLE
S1	FOUNDATION PLAN AND SECTIONS

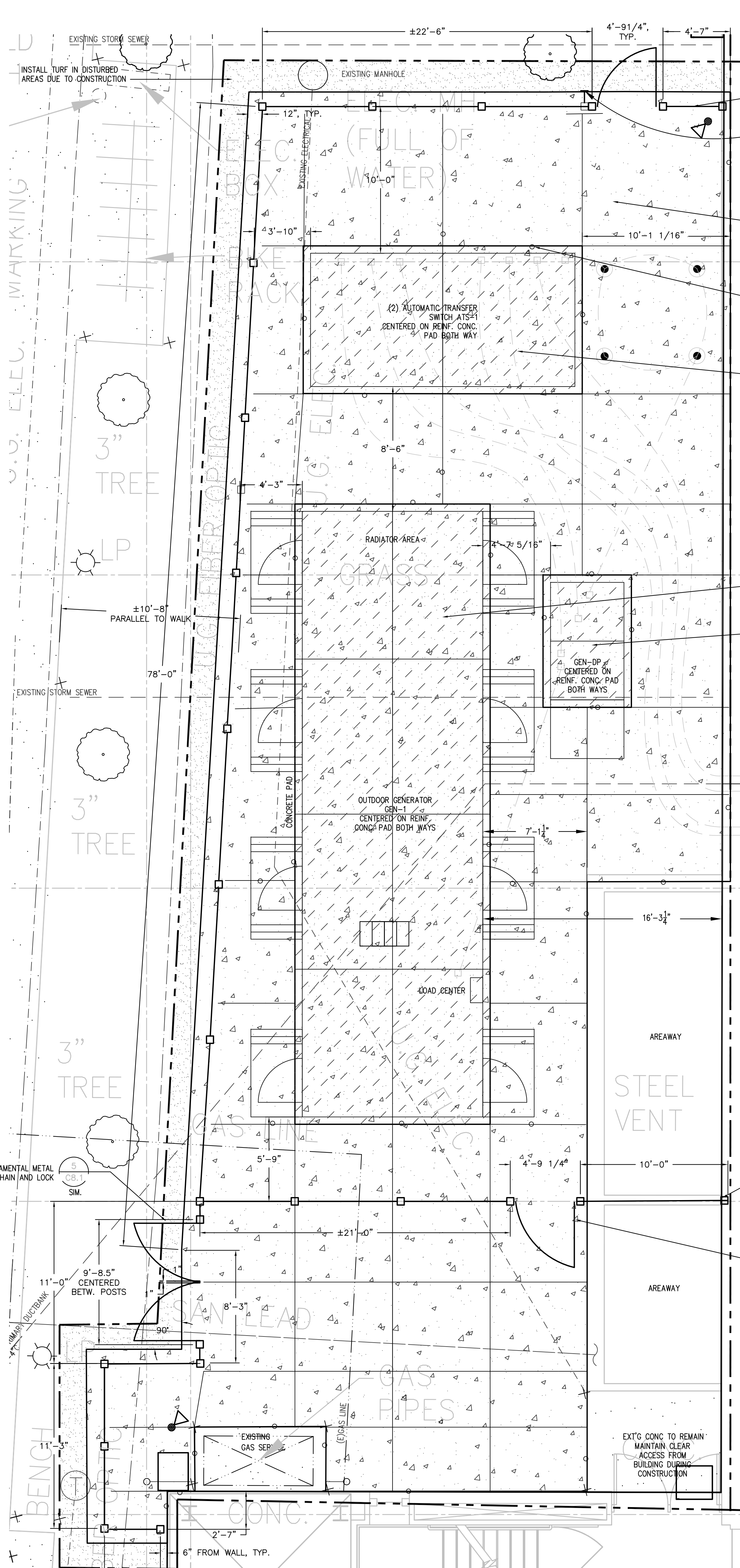
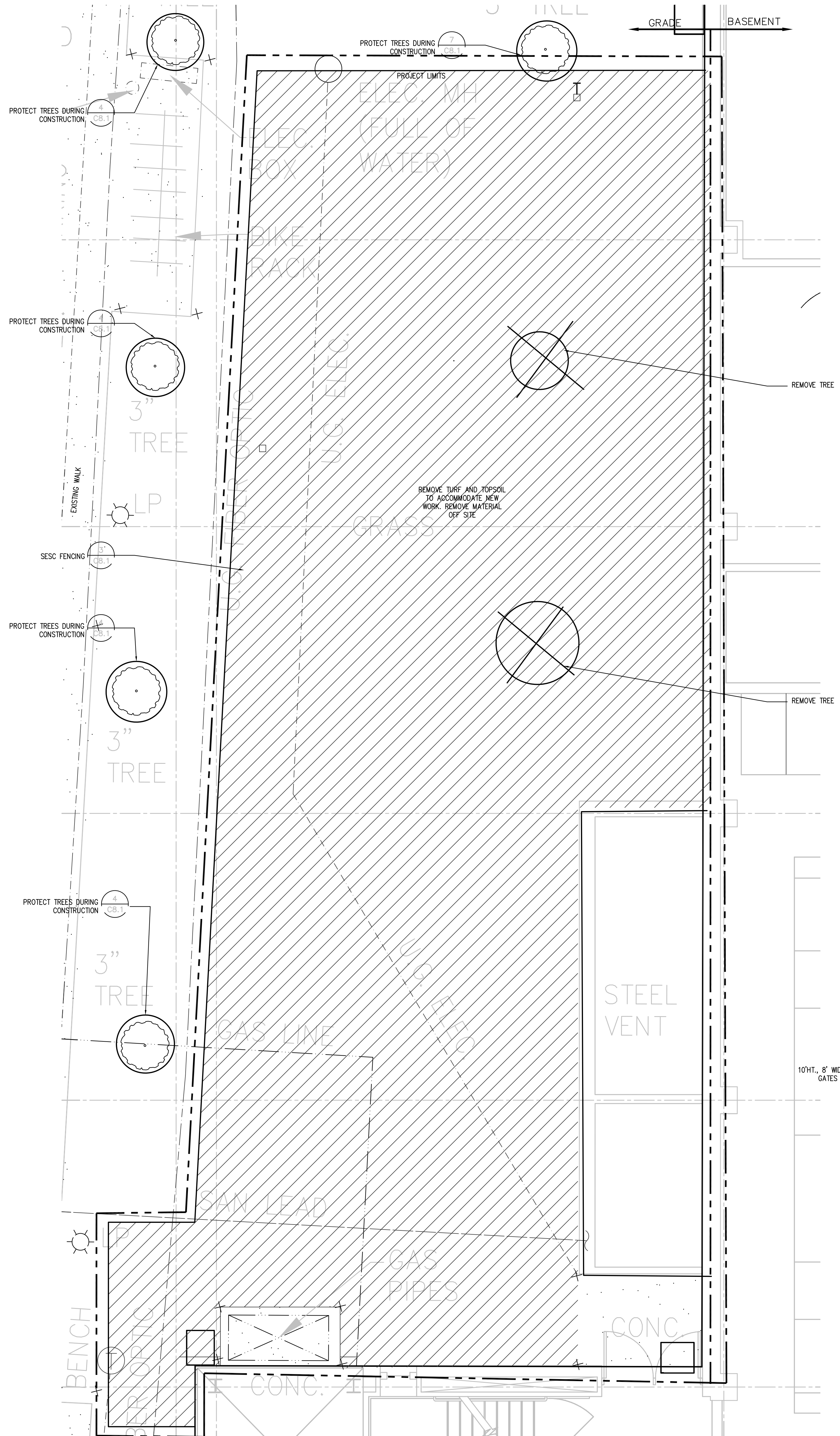
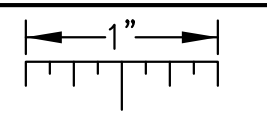
ELECTRICAL DRAWING INDEX

SHEET NO.	SHEET TITLE
E0.1	ELECTRICAL STANDARDS AND DRAWING INDEX
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E5.2	PANEL SCHEDULES
E7.1	ELECTRICAL DETAILS AND DIAGRAMS

**CONTROLS
(BY SIEMENS FOR REFERENCE ONLY)**

SHEET NO.	SHEET TITLE
ABAC	ANXITER BUILDING AUTO. CABLES
SPEC1	ELECTRICAL INSTALL SPEC.
SPEC2	ELECTRICAL INSTALL SPEC.
SPEC3	ELECTRICAL INSTALL SPEC.
001	GENERATOR/FUEL OIL CONTROL
001A	GENERATOR/FUEL OIL CONTROL
001B	GENERATOR/FUEL OIL CONTROL
001C	GENERATOR ELECTRICAL DIAGRAM

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



LEGEND

- CONCRETE-ROAD
- CONCRETE-REINFORCED
- SOD
- EXPANSION JOINT
- ORNAMENTAL METAL FENCE
- EXISTING ELEVATION
- PROPOSED ELEVATION
- EXTG LIGHT POLE & FOUNDATION
- EXTG FIRE HYDRANT
- EXTG CATCH BASIN
- EXTG MANHOLE

SOIL EROSION & SEDIMENTATION CONTROL NOTES

THE CONTRACTOR SHALL COMPLY WITH ALL CONTRACT DOCUMENTS, APPROVED SESC PLANS, PERMIT CONDITIONS AND WITH PARTS 31 AND 91 OF PUBLIC ACT 451 OF 1994. THE OWNER SHALL OBTAIN A SOIL EROSION AND SEDIMENTATION CONTROL (SESC) PERMIT FROM THE APPROPRIATE MUNICIPAL ENGINEERING AGENCY (MEA) OR COUNTY ENGINEERING AGENCY (CEA). PERMIT FEES AND ROUTINE INSPECTIONS CHARGED BY THE MEA/CEA WILL BE PAID FOR BY THE OWNER.

PRIOR TO BEGINNING ANY EARTH CHANGE, THE CONTRACTOR SHALL RETAIN A DEQ CERTIFIED STORM WATER OPERATOR (CSWO) TO PROVIDE THE REQUIRED SESC REPORTS (WHICH INCLUDE THE WEEKLY AND STORM EVENT REPORTS AS WELL AS ALL FOLLOW UP REPORTS FOR BOTH VIOLATIONS AND STORM EVENT CORRECTIONS) ON THE STANDARD DEQ FORM. THE CONTRACTOR SHALL PROVIDE THE REPORTS TO THE OWNER ON A WEEKLY BASIS, AND RETAIN THOSE REPORTS FOR THREE YEARS.

PRIOR TO BEGINNING ANY EARTH CHANGE, THE CONTRACTOR SHALL INSTALL AND MAINTAIN ALL SESC MEASURES AS SHOWN ON THE CONTRACT DOCUMENTS AND AS DIRECTED BY THE OWNER, CSWO, MEA/CEA OR DEQ AT ANYTIME DURING THE LIFE OF THE CONTRACT OR UNTIL MSU OFFICIALLY TAKES OVER RESPONSIBILITY FOR THE SITE. IMMEDIATELY PRIOR TO MSU TAKING RESPONSIBILITY FOR THE SITE, THE CONTRACTOR WILL BE REQUIRED TO CLEAN ALL CATCH BASINS AFFECTED BY THE CONSTRUCTION, BOTH WITHIN THE CONTRACT LIMITS AND ALL SURROUNDING ROADS AND LAWN AREAS WHEN SOIL MAY HAVE SPREAD AS THE RESULT OF CONSTRUCTION ACTIVITIES.

THE CONTRACTOR SHALL CONDUCT ALL EXCAVATION, FILLING, GRADING, AND CLEANUP OPERATIONS IN A MANNER SUCH THAT SEDIMENT, GENERATED BY WIND OR WATER IS NOT DISCHARGED INTO ANY STORM SEWER, DRAINAGE DITCH, RIVER, LAKE, AIR, OR UNDERGROUND UTILITY SYSTEM. STAGE WORK TO MINIMIZE THE AREA OF EXPOSED SOIL, THEREBY REDUCING THE OPPORTUNITY FOR SOIL EROSION.

WATER FROM TRENCHES AND OTHER EXCAVATION SHALL BE PUMPED INTO A FILTRATION BAG TO REMOVE SEDIMENTS FROM THE WATER.

IF SEDIMENT EXTENDS BEYOND THE PROJECT LIMITS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANUP AND RESTORATION OF ALL SURFACES AND UTILITY SYSTEMS TO THE CONDITION THAT EXISTED PRIOR TO THE CONTRACT AWARD.

ALL SESC MEASURES SHALL BE MAINTAINED DAILY.

SHOULD VIOLATIONS BE IDENTIFIED BY THE OWNER, CSWO, MEA/CEA OR DEQ, THEY SHALL BE CORRECTED WITHIN 24 HOURS OF NOTIFICATION. THE CORRECTION(S) SHALL BE APPROVED BY THE OWNER, CSWO, MEA/CEA OR DEQ. ALL SUBSEQUENT INSPECTIONS PERFORMED BY THE OWNER, CSWO, MEA/CEA OR DEQ AS A RESULT OF THE VIOLATION (AND ANY OTHER ASSOCIATED COSTS) WILL BE PAID BY THE CONTRACTOR.

FINES ASSESSED AS A RESULT OF THE VIOLATION FOR NONCOMPLIANCE OF THE SESC PROVISIONS, WILL BE PAID BY THE CONTRACTOR. SHOULD A "STOP WORK" ORDER FOR NONCOMPLIANCE BE ISSUED, A TIME EXTENSION REQUEST FOR THAT TIME PERIOD WILL NOT BE GRANTED.

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

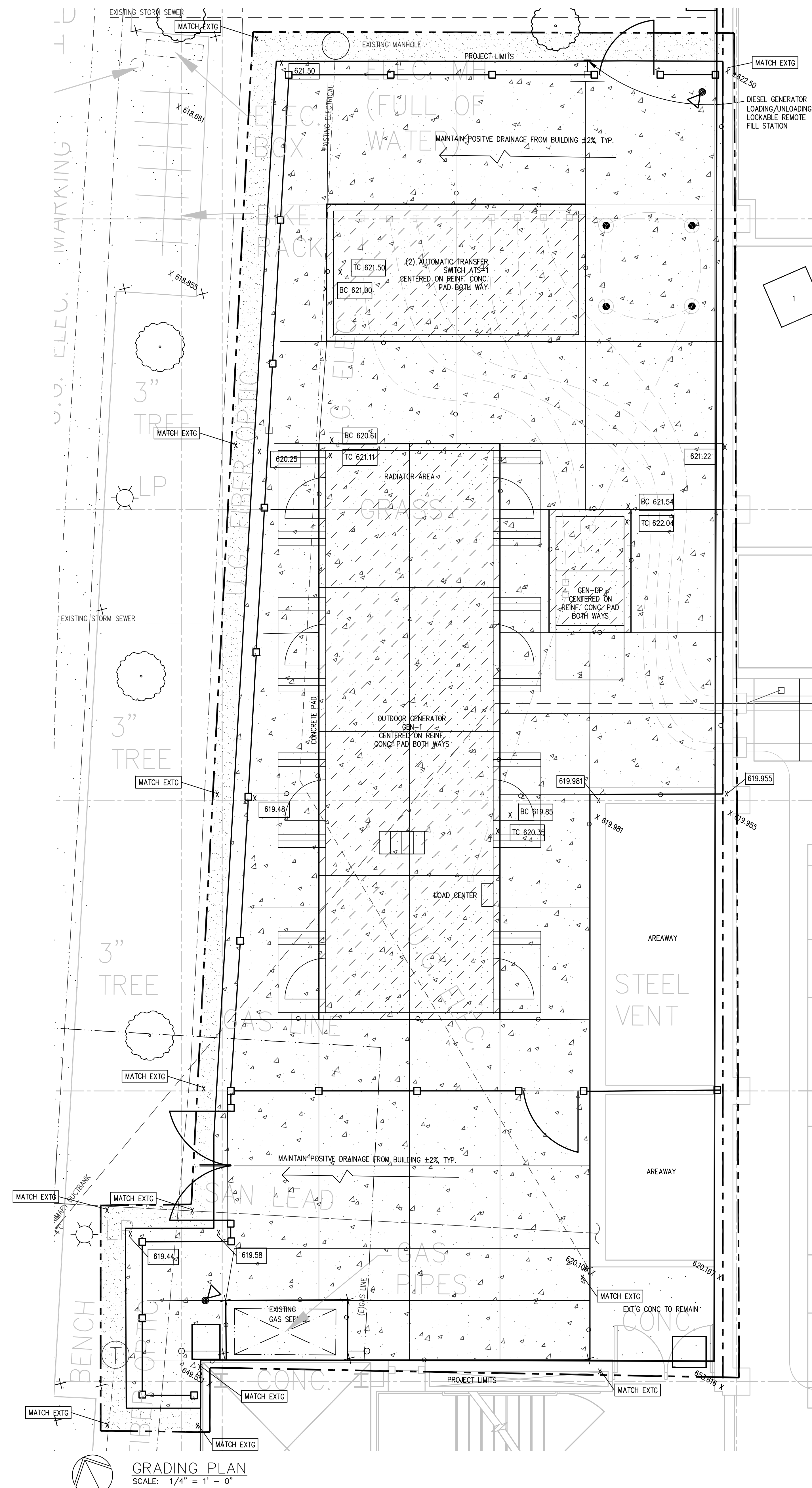
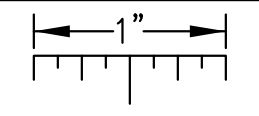
SITE PLAN
SCALE: 1/4" = 1' - 0"

PROJECT TITLE: WSU 603 - COLLEGE OF PHARMACY ELECTRICAL RELIABILITY UPGRADE
 SHEET TITLE: DEMOLITION PLAN SITE PLAN
 DATE: 8/26/2014
 ISSUE: BIDS
 SHEET No.: C5.1

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THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



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

LEGEND

- EX. SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- CATCH BASIN
- MANHOLE
- LIGHT POLE & FOUNDATION
- FIRE HYDRANT

NOTES

1. TOP OF NEW PAVEMENT AND NEW CURBS SHALL MEET FLUSH WHERE IT ABUTS EXISTING ADJACENT PAVEMENTS AND CURBS.
 2. ALL PROPOSED ELEVATIONS REPRESENT FINISHED GRADES.
 3. SIDEWALK CROSS SLOPE SHALL BE 2% UNLESS OTHERWISE NOTED (EXCLUDING RAMP).
 4. MAINTAIN POSITIVE DRAINAGE AWAY FROM ALL BUILDINGS (±2%).
- NOTE:
EXISTING ELEVATIONS ARE FEW.
PROPOSED GRADES ARE APPROXIMATE.
CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM BUILDING.

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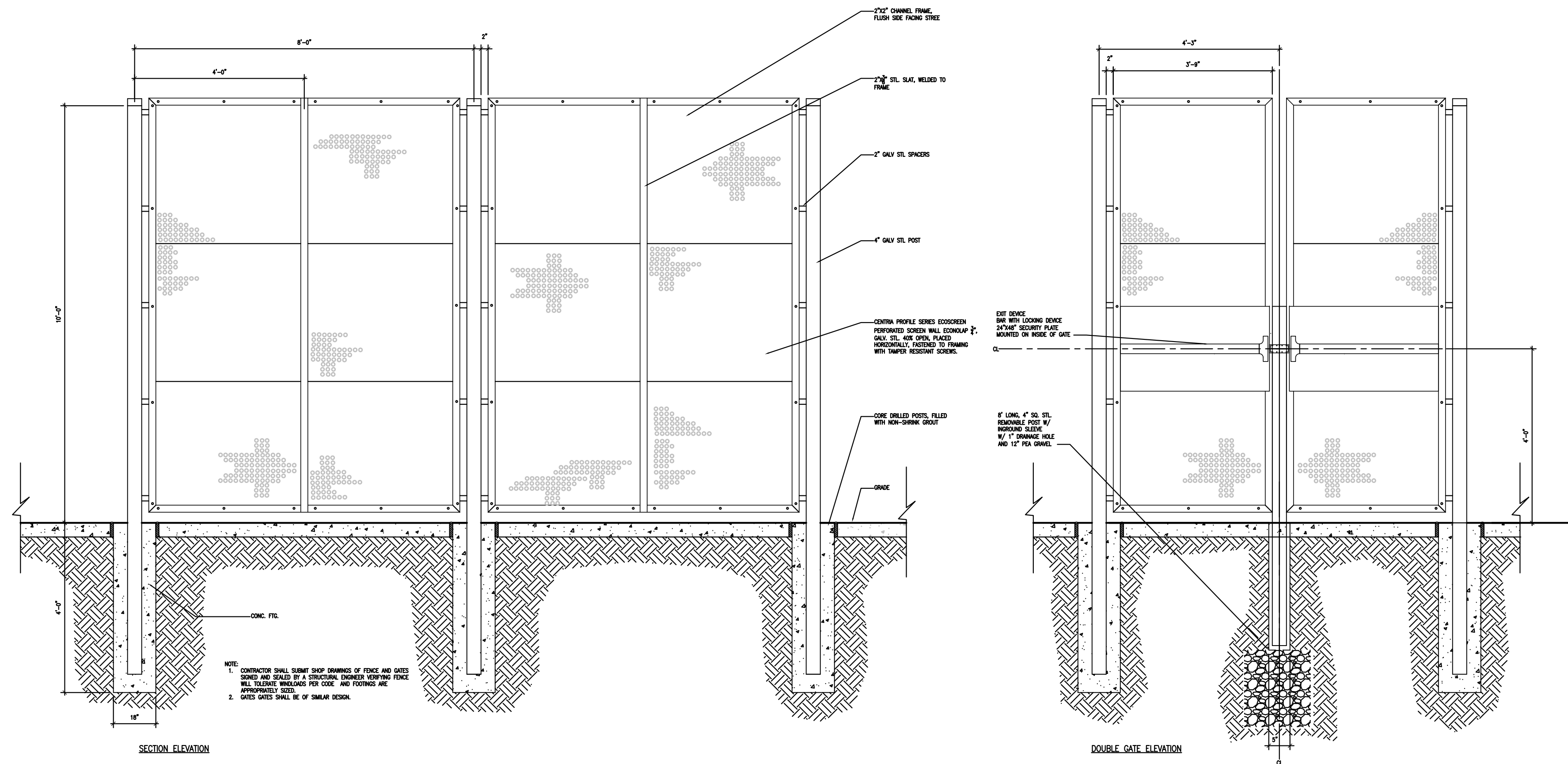
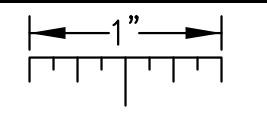
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 ELECTRICAL RELIABILITY
 UPGRADE
 WSU Project No.: 603-243264
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WAYNE STATE UNIVERSITY

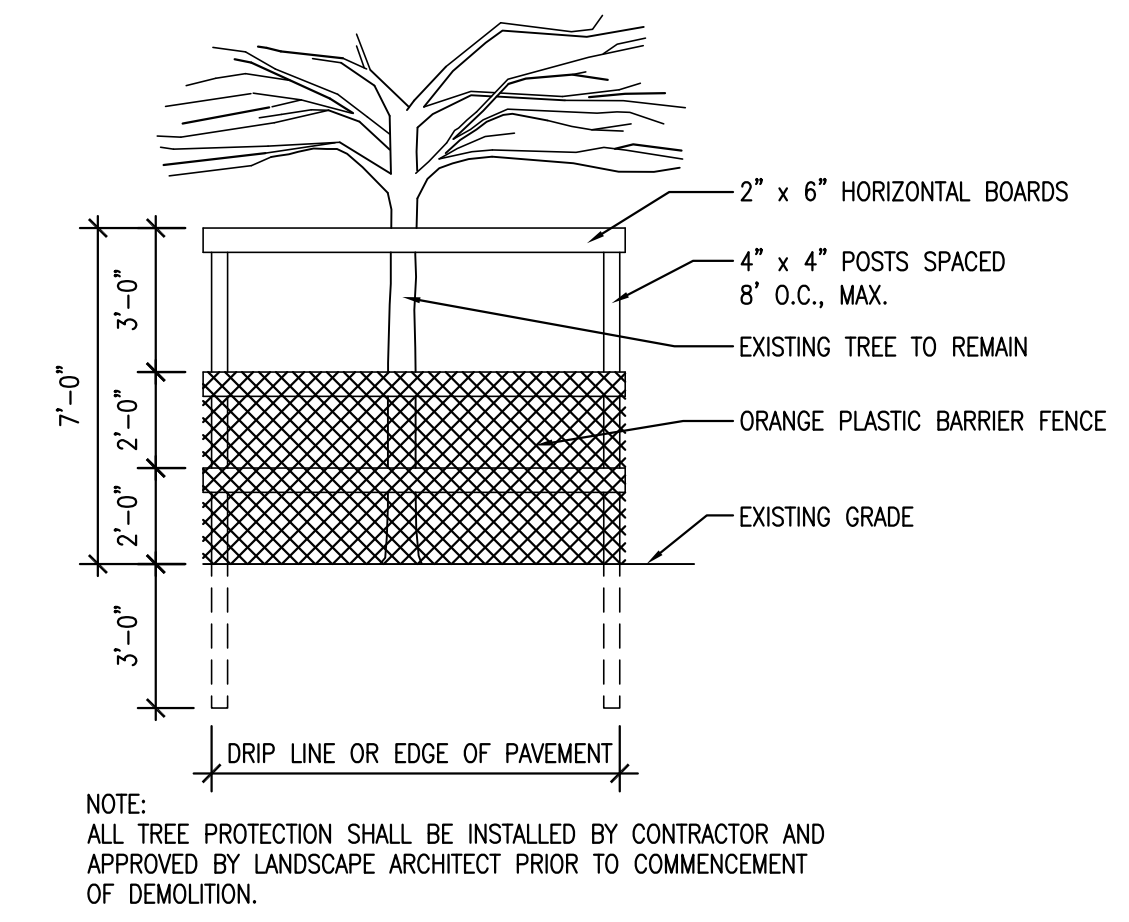
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 GRADING PLAN
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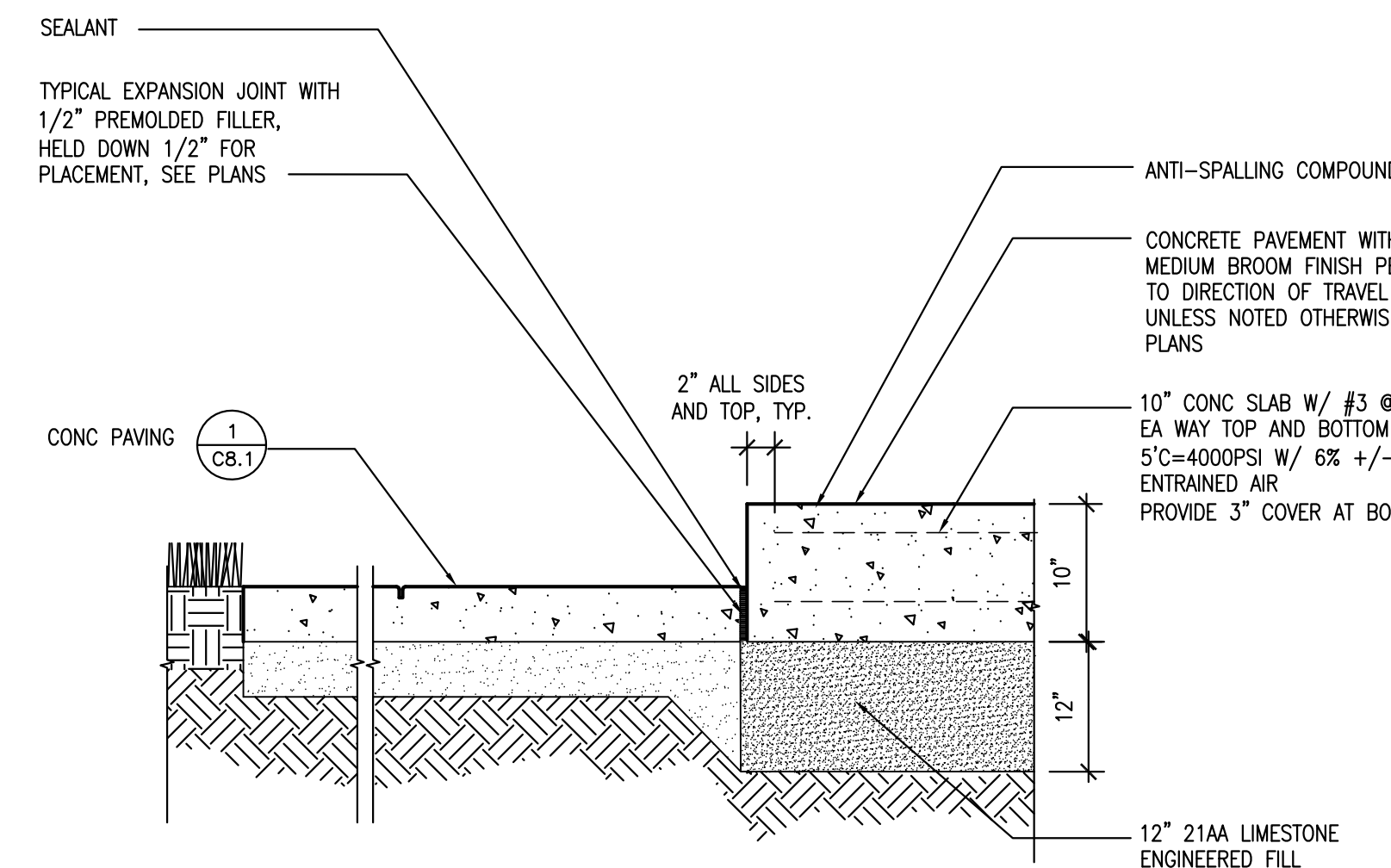
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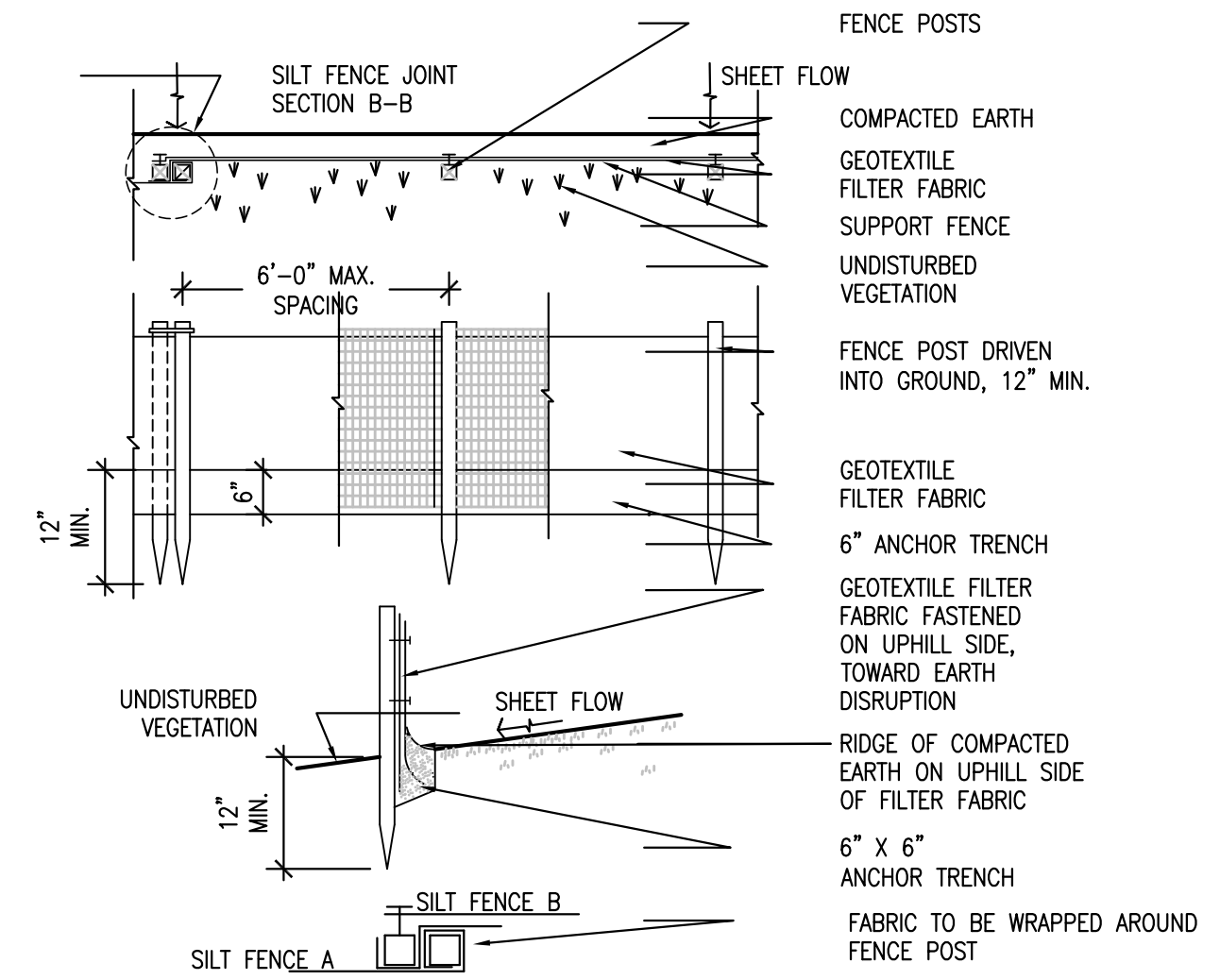
7 BASE BID - PANEL FENCE
SCALE: 1/4\"=1'-0\"



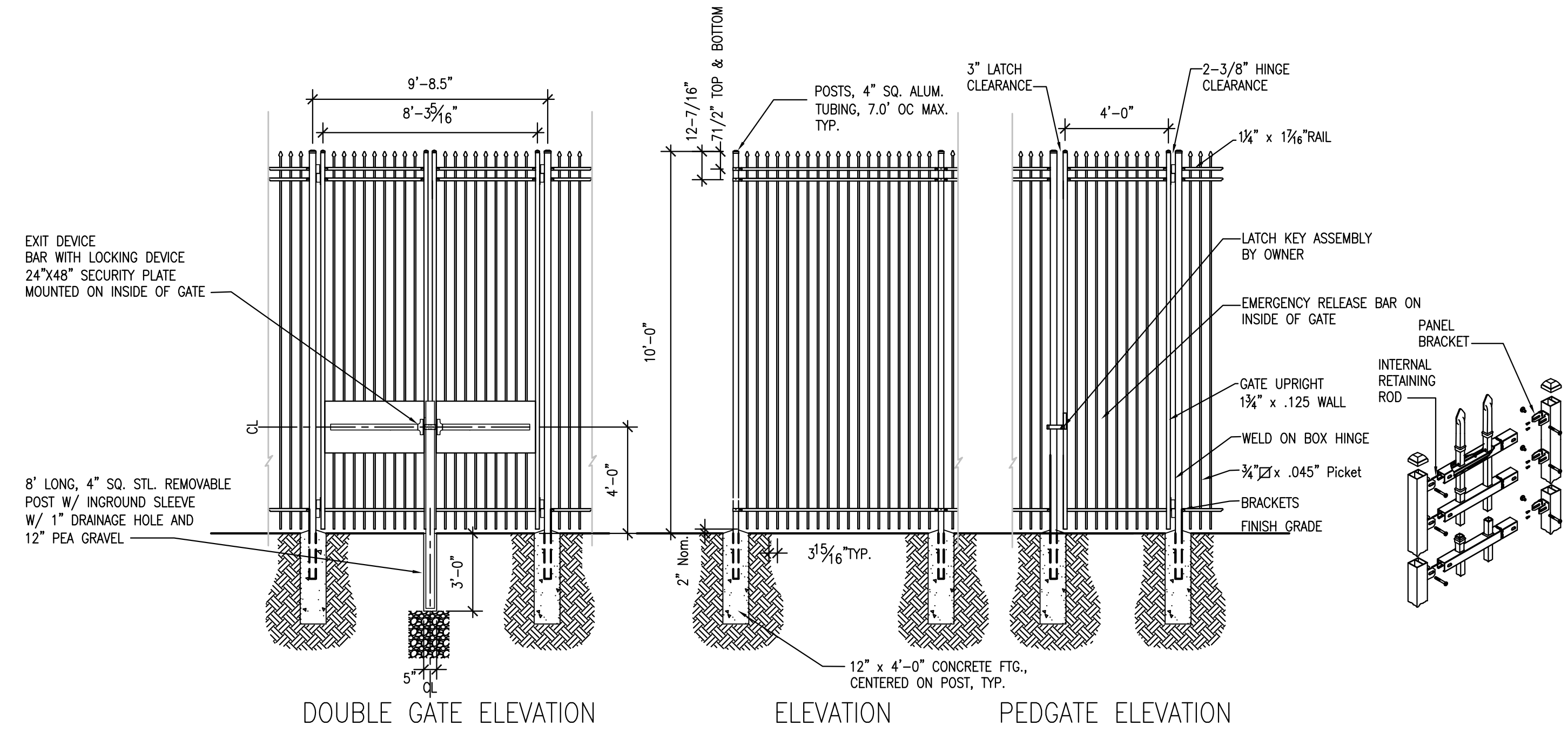
7 TREE PROTECTION FENCING
SCALE: 1/4\"=1'-0\"



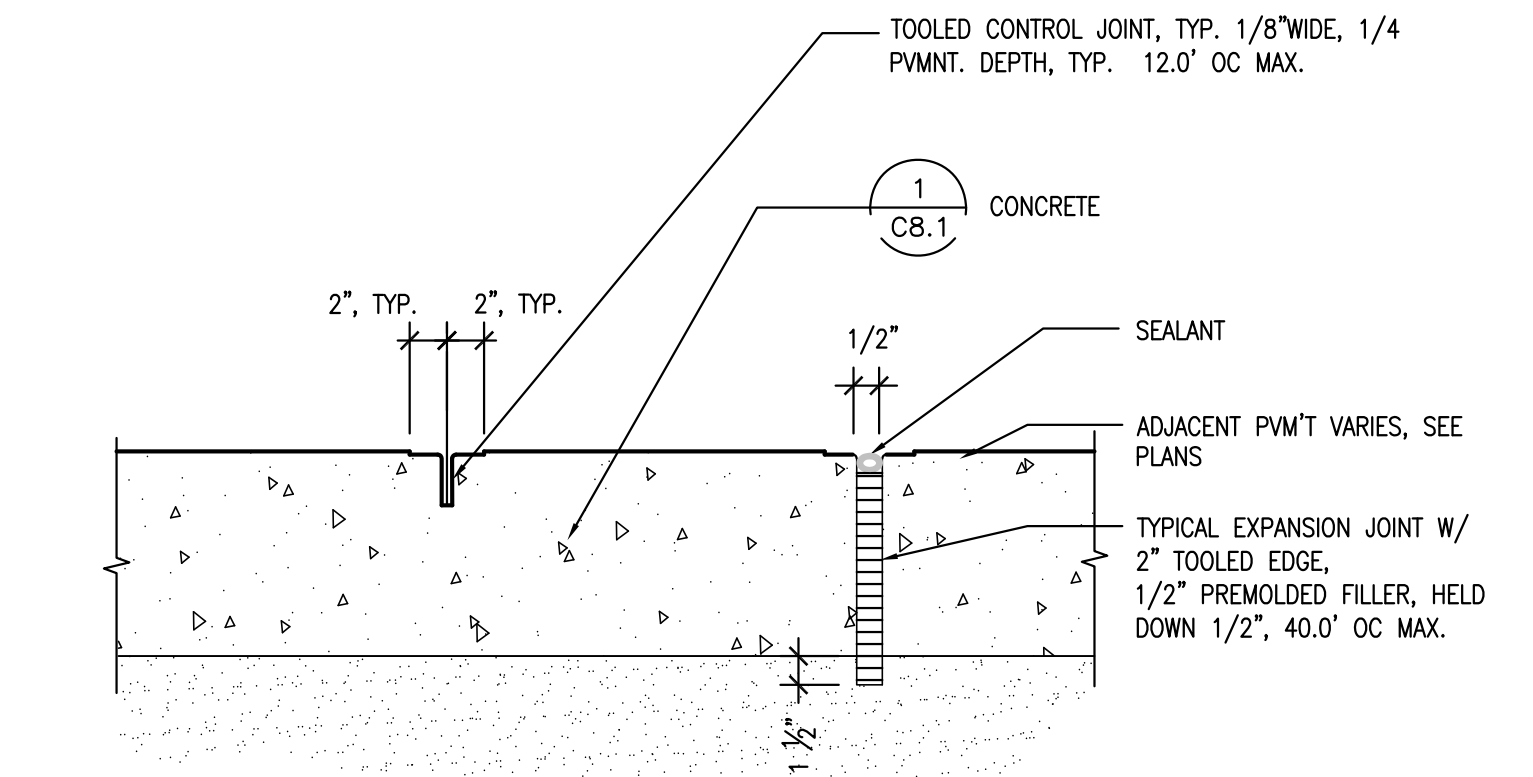
6 REINFORCED CONCRETE PAD CONCRETE PAVEMENT
SCALE: 1\"=1'-0\"



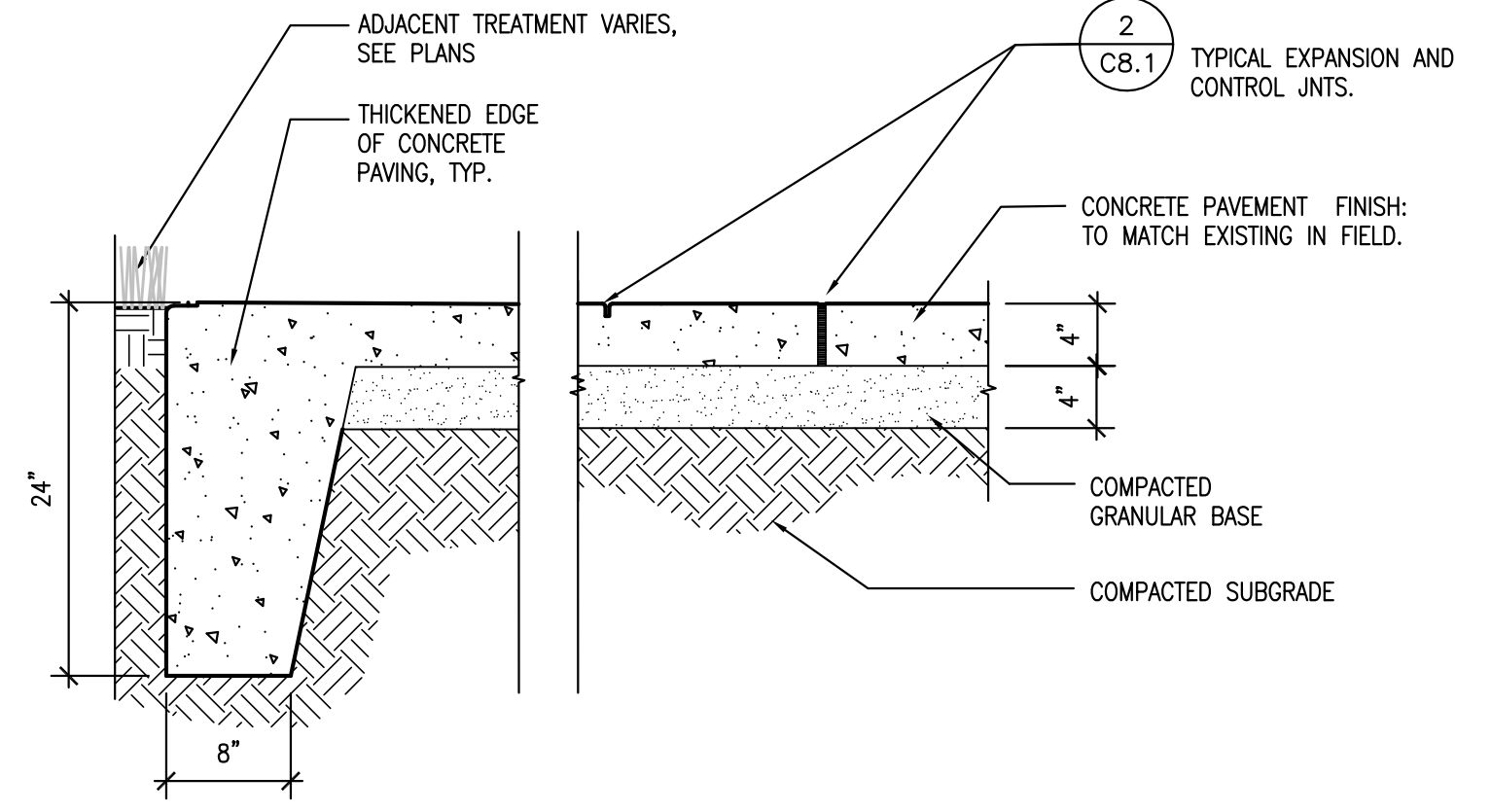
8 SILT FENCE
SCALE: 1\"=1'-0\"



5 ALTERNATE 1 BID: ORNAMENTAL METAL FENCE WITH PEDESTRIAN GATE
SCALE: 1/4\"=1'-0\"



2 EXPANSION & CONTROL JOINTS
SCALE: 1\"=1'-0\"



1 4\" CONCRETE PAVEMENT
SCALE: 1\"=1'-0\"

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PROJECT TITLE
WSU 603 - COLLEGE OF PHARMACY ELECTRICAL RELIABILITY UPGRADE
WSU Project No.: 603-243264
Detroit, MI 48202

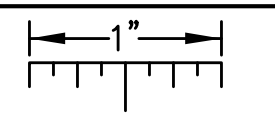
WAYNE STATE UNIVERSITY

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DATE
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SHEET No.
C8.1

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THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



CONCRETE:

- THE CONCRETE PORTIONS OF THIS STRUCTURE ARE DESIGNED ACCORDING TO THE LATEST ULTIMATE STRENGTH DESIGN PROVISIONS OF THE AMERICAN CONCRETE INSTITUTE BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE AND COMMENTARY (ACI 318) INCLUDING SECTIONS 1902 THRU 1907 OF CHAPTER 19 IN THE MICHIGAN BUILDING CODE. CONCRETE COMPONENTS HAVE BEEN DESIGNED ACCORDING TO THE PROVISIONS FOR SEISMIC DESIGN CATEGORY B.
- ALL CONCRETE SHALL BE NORMAL WEIGHT (150 PCF). PROVIDE $f_c=4000$ PSI WITH 6% +/- 1% ENTRAINED AIR WHERE CONCRETE IS EXPOSED TO EXTERIOR ATMOSPHERE OR WEATHER.
- ALL CONCRETE SHALL BE PORTLAND CEMENT CONFORMING TO ASTM C150. AGGREGATE SHALL CONFORM TO ASTM C33.
- CONCRETE ADMIXTURES SHALL BE USED TO FACILITATE CONCRETE PLACEMENT, AID DIFFICULT PLACING CONDITIONS OR ASSIST IN ATTAINING SPECIFIED CONCRETE QUALITIES. ADMIXTURES SHALL HAVE LESS THAN 0.05 PERCENT CHLORIDE IONS.
 - AIR ENTRAINMENT PER ASTM C260
 - WATER REDUCER PER ASTM C494, TYPE A
 - WATER REDUCER/ACCELERATOR PER ASTM C494, TYPE C OR E
 - WATER REDUCER/RETARDER PER ASTM C494, TYPE B OR TYPE D
 - SUPERPLASTICIZER PER ASTM C494, TYPE F OR G
- CONCRETE MIXES SHALL BE PROPORTIONED PER SECTION 3.9 OF ACI-301. CERTIFIED HISTORICAL TEST DATA SHALL SERVE AS A BASIS FOR EACH MIX DESIGN. DEVIATIONS SHALL BE SUBSTANTIATED WITH ADDITIONAL CERTIFIED TRIAL MIX TESTING AND RESULTS. SUBMIT MIX DESIGN, HISTORICAL TEST DATA OR TRIAL MIX RESULTS FOR APPROVAL PRIOR TO PROCEEDING WITH THE WORK. WHERE HISTORICAL TEST DATA IS NON-EXISTENT THE FOLLOWING GUIDELINES SHALL APPLY:

TYPE	COMPRESSIVE STRENGTH, f_c (28 DAY, PSI)	CEMENT CONTENT (LBS./C.Y.)	WATER/CEMENT RATIO (BY WEIGHT)	SUMP (4" MAX.)
AIR ENTRAINED, NORM. WT.	4000 MIN.	564 MIN.	0.45 MAX.	4" MAX.
- ALL REINFORCING BARS, DOWELS AND TIES SHALL CONFORM TO ASTM A615, GRADE 60. ALL REINFORCING STEEL SHALL BE CONTINUOUS AND SHALL HAVE 36 BAR DIAMETER LAP (MIN.) AND SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH ACI 315 AND ACI 318, LATEST EDITION. HOOK ALL BEAM BARS AT DISCONTINUOUS ENDS.
- ALL EXPOSED CONCRETE CORNERS AND EDGES SHALL BE CHAMFERED 3/4".
- ALL CONCRETE FOR REPAIR APPLICATIONS TO INFILL HOLES OR SHAFTS OF SIZE 12 INCHES SQUARE OR LESS, SHALL BE FIVE STAR STRUCTURAL CONCRETE V/D' OR APPROVED EQUAL. MINIMUM COMPRESSIVE STRENGTH SHALL BE $f_c=5000$ PSI MIN. AT 28 DAYS, UNLESS NOTED OTHERWISE.

GENERAL NOTES:

GENERAL CONDITIONS

- IF ANY GENERAL NOTE CONFLICTS WITH ANY DETAIL OR NOTE ON THE PLANS OR IN THE SPECIFICATIONS, THE STRICTEST PROVISION SHALL GOVERN.
- THE STRUCTURAL DRAWINGS ARE FOR THE PLACEMENT OF THE PROJECT STRUCTURAL COMPONENTS ONLY. REQUIREMENTS MADE BY OSHA, DNR, AND ALL APPLICABLE SAFETY CODES ARE TO BE DETERMINED AND PROVIDED BY THE CONTRACTOR.
- THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER IT IS FULLY COMPLETED ACCORDING TO THE PLANS AND SPECIFICATIONS. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE CONSTRUCTION/ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES PROVIDING TEMPORARY BRACING, SHORING, GUYS OR TIE-DOWNS. THESE TEMPORARY SUPPORTS SHALL REMAIN IN PLACE UNTIL ALL STRUCTURAL COMPONENTS ARE IN PLACE AND COMPLETED AS THE STRUCTURAL MEMBERS OR SYSTEMS ARE NOT SELF-BRACING UNTIL PERMANENTLY CONNECTED TO THE STRUCTURE.
- THE ARCHITECT AND STRUCTURAL ENGINEER ASSUME NO LIABILITY FOR THE STRUCTURE DURING CONSTRUCTION. AS SUCH, THE MEANS AND METHODS OF CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR(S).
- USE OF THESE ENGINEERING DRAWINGS, PLANS OR DETAILS USED AS ERECTION PLANS OR SHOP DRAWINGS BY THE CONTRACTOR IS EXPRESSLY PROHIBITED. SUBMITTALS BEARING IMAGES ELECTRONICALLY COPIED FROM THE ENGINEERING DRAWINGS WILL BE REJECTED.

REQUIRED INSPECTIONS

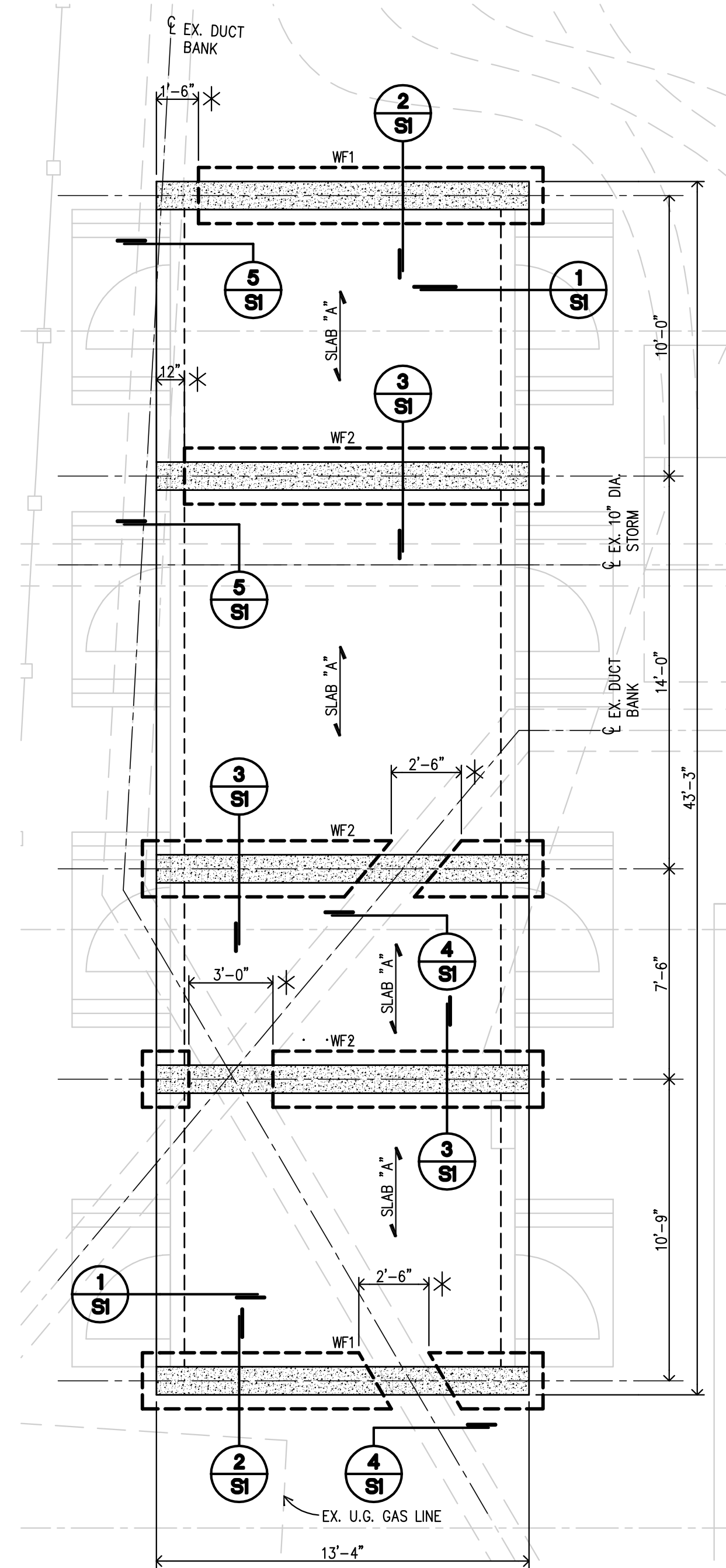
COORDINATE PROPOSED CONSTRUCTION SCHEDULE WITH THE OWNER'S SPECIAL INSPECTOR AND QUALITY TESTING AGENCY PROVIDING ADEQUATE NOTICE IN ORDER TO ALLOW THE FOLLOWING INSPECTIONS. SEE PROJECT MANUAL AND REFERENCED CODES FOR SPECIFIC INSPECTION AND TESTING REQUIREMENTS.

- SOIL BEARING CAPACITY
 - SUB-GRADE PREPARATION AND FILL COMPACTION
 - CONCRETE
- CONCRETE INSPECTIONS AND TESTING**
- TESTING AGENCY QUALIFICATIONS: AN INDEPENDENT TESTING AGENCY, ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, QUALIFY ACCORDING TO ASTM C 1077 AND ASTM C 329 TO CONDUCT THE TESTING INDICATED, AS DOCUMENTED ACCORDING TO ASTM E 848.
 - PERSONNEL CONDUCTING FIELD TESTS SHALL BE QUALIFIED AS ACI CONCRETE FIELD TESTING TECHNICIAN, GRADE 1, ACCORDING TO ACI CP-1 OR AN EQUIVALENT CERTIFICATION PROGRAM.
 - INSPECTIONS SHALL INCLUDE:
 - STEEL REINFORCEMENT PLACEMENT.
 - VERIFICATION OF USE OF REQUIRED DESIGN MIXTURE.
 - CONCRETE PLACEMENT, INCLUDING CONVEYING AND DEPOSITING.
 - CURING PROCEDURES AND MAINTENANCE OF CURING TEMPERATURE.
 - TESTING SHALL INCLUDE:
 - VERIFICATION OF CONCRETE STRENGTH BEFORE REMOVAL OF SHORES AND FORMS FROM BEAMS AND SLABS.
 - TESTING OF COMPOSITE SAMPLES OF FRESH CONCRETE OBTAINED ACCORDING TO ASTM C 172.
 - COMPRESSION TEST SPECIMENS: ASTM C 31/C 31M.
 - COMPRESSION-STRENGTH TESTS: ASTM C 39/C 39M; TEST ONE SET OF TWO LABORATORY-CURED SPECIMENS AT 7 DAYS AND ONE SET OF TWO SPECIMENS AT 28 DAYS.
 - SUMP: ASTM C 143/C 143M; ONE TEST AT POINT OF PLACEMENT FOR EACH COMPOSITE SAMPLE, BUT NOT LESS THAN ONE TEST FOR EACH DAY'S POUR OF EACH CONCRETE MIXTURE. PERFORM ADDITIONAL TESTS WHEN CONCRETE CONSISTENCY APPEARS TO CHANGE.
 - CONCRETE TEMPERATURE: ASTM C 1064/C 1064M; ONE TEST HOURLY WHEN AIR TEMPERATURE IS 40 DEG F AND BELOW AND WHEN 80 DEG F AND ABOVE, AND ONE TEST FOR EACH COMPOSITE SAMPLE.
 - AIR CONTENT: ASTM C 231, PRESSURE METHOD, FOR NORMAL-WEIGHT CONCRETE; ASTM C 173, VOLUMETRIC METHOD, FOR STRUCTURAL LIGHTWEIGHT CONCRETE. ONE TEST FOR EACH COMPOSITE SAMPLE, BUT NOT LESS THAN ONE TEST FOR EACH DAY'S POUR OF EACH CONCRETE MIXTURE.
 - UNIT WEIGHT: ASTM C 567, FRESH UNIT WEIGHT OF STRUCTURAL LIGHTWEIGHT CONCRETE; ONE TEST FOR EACH COMPOSITE

FOUNDATIONS:

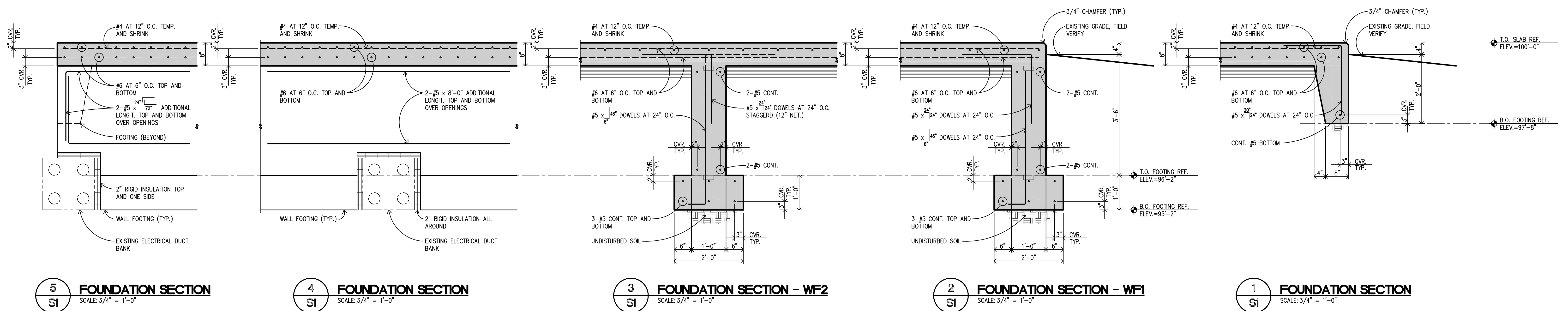
EXCAVATIONS

- FOUNDATIONS SHALL BEAR ON FIRM UNDISTURBED SOIL WITH AN ASSUMED SAFE BEARING CAPACITY OF 3000 PSF, IN ACCORDANCE WITH THE PROJECT SOILS REPORT NO. 069961.00, PREPARED BY SOIL AND MATERIALS ENGINEERS, INC. (DATED 07-21-14). IF SOIL OF THIS CAPACITY IS NOT FOUND AT THE ELEVATIONS INDICATED, FOOTINGS SHALL BE ENLARGED OR LOWERED AT THE DIRECTION OF THE ARCHITECT. ALLOWABLE SOIL BEARING PRESSURE SHALL BE CONFIRMED IN THE FIELD BY A QUALIFIED SOILS ENGINEER.
- UNLESS OTHERWISE NOTED OR DETAILED, ALL FOUNDATIONS SHALL BE LOCATED SUCH THAT THE CENTERLINE OF FOOTING IS ALSO THE CENTERLINE OF COLUMN.
- PROVIDE NECESSARY SHEETING, SHORING, FORMING OR BRACING, ETC., DURING EXCAVATION AS REQUIRED TO PROTECT SIDES OF EXCAVATIONS OR AS REQUIRED TO COMPLY WITH SAFETY REGULATIONS. DO NOT BACKFILL BEHIND BASEMENT WALLS UNTIL FLOOR FRAMING OR TEMPORARY BRACING IS IN PLACE.
- AS IDENTIFIED IN THE PROJECT SOILS REPORT, EARTH-FORMED FOUNDATIONS, I.E. "TRENCHING", IS NOT CONSIDERED FEASIBLE. CONTRACTOR SHALL INCLUDE ALL NECESSARY OVER-EXCAVATION, FORMWORK AND BACKFILLING IN BID. ATTEMPTS TO EARTH-FORM FOUNDATIONS ON THIS PROJECT WITHOUT PRIOR DEMONSTRATION AND APPROVAL BY THE ENGINEER WILL BE REJECTED.
- PREPARATION OF THE SITE, BUILDING FOOTPRINT AND SLAB SUB-BASE SHALL PROCEED IN COMPLIANCE WITH LOCAL CODES AND THE PROJECT SOILS REPORT IDENTIFIED ABOVE. UNLESS OTHERWISE NOTED OR SPECIFIED, ALL FILL UNDER FLOOR SLABS AND BEHIND FOUNDATION WALLS SHALL BE COMPACTED WITH VIBRATORS, COMPACTORS, ETC. TO 95% MAXIMUM DENSITY (MODIFIED PROCEDURE) AT OPTIMUM MOISTURE CONTENT. ONLY SMALL, HAND OPERATED COMPACTION EQUIPMENT SHALL BE ALLOWED WITHIN 8 FEET OF BASEMENT WALLS.
- THIS TRADE SHALL PROVIDE PUMPS, WELL POINTS, OR OTHER SYSTEMS AS REQUIRED BY THE CONDITIONS IDENTIFIED IN THE PROJECT SOILS REPORT. PUMPS SHALL BE OPERATED AS REQUIRED TO ACCOMPLISH THE ABOVE, ON A 24-HOUR BASIS, IF NECESSARY. UNDER NO CONDITION SHALL WATER BE ALLOWED TO WASH OVER FRESHLY PLACED CONCRETE.



GENERATOR PAD FOUNDATION PLAN
SCALE: 1/4" = 1'-0"

SLAB "A" INDICATES 8" THICK CONCRETE SLAB WITH #6 AT 6" O.C. TOP AND BOTTOM AND #4 AT 12" O.C. TEMP. AND SHRINKAGE TOP.
* INDICATES EXISTING UTILITIES AND DIMENSIONS MUST BE VERIFIED CAREFULLY IN THE FIELD.



5 FOUNDATION SECTION
SCALE: 3/4" = 1'-0"

4 FOUNDATION SECTION
SCALE: 3/4" = 1'-0"

3 FOUNDATION SECTION - WF2
SCALE: 3/4" = 1'-0"

2 FOUNDATION SECTION - WF1
SCALE: 3/4" = 1'-0"

1 FOUNDATION SECTION
SCALE: 3/4" = 1'-0"

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PROJECT TITLE
**WSU 603 - COLLEGE OF PHARMACY
ELECTRICAL RELIABILITY
UPGRADE**
WSU Project No.: 603-243264
Detroit MI 48202

WAYNE STATE UNIVERSITY

SHEET TITLE
**FOUNDATION PLAN
AND SECTIONS**

DATE
8/26/2014

ISSUE
BIDS

SHEET No.

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ELECTRICAL SYMBOL LIST

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

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
FX	FIXTURE TYPE	TWC	TWO-WAY COMMUNICATION SYSTEM CALL STATION	CP	CONTROL PANEL	F	MANUAL FIRE ALARM BOX
[Symbol]	LIGHTING FIXTURE	TW2D	TWO-WAY COMMUNICATION SYSTEM AUTO DIALER	MD	MOTION DETECTOR	SD	SMOKE DETECTOR
[Symbol]	DIRECT/INDIRECT LIGHTING FIXTURE	TW2A	TWO-WAY COMMUNICATION SYSTEM ANNUNCIATOR & COMMUNICATION PANEL	VFC	VARIABLE FREQUENCY CONTROLLER	DD	DUCT SMOKE DETECTOR
[Symbol]	EMERGENCY FIXTURE	TW2C	TWO-WAY COMMUNICATION SYSTEM AUTO DIALER	MC	MANUAL CONTROLLER	RT	REMOTE TEST STATION (FOR DUCT DETECTOR)
[Symbol]	NIGHT LIGHTING FIXTURE	TW2P	TWO-WAY COMMUNICATION SYSTEM POWER SUPPLY WITH BATTERY BACK-UP	MP	MAGNETIC CONTROLLER	TD	THERMAL DETECTOR
[Symbol]	WALL MOUNTED LIGHTING FIXTURE	TW2CP	TWO-WAY COMMUNICATION SYSTEM AUTO DIALER POWER SUPPLY WITH BATTERY BACK-UP	CM	COMBINATION MAGNETIC CONTROLLER	BD	PROJECTED BEAM DETECTOR
[Symbol]	LIGHTING FIXTURE	RGP	REMOTE GENERATOR ANNUNCIATOR PANEL	DB	DURESS PUSH BUTTON STATION	FC	FIRE ALARM BELL
[Symbol]	EMERGENCY LIGHTING FIXTURE	ATS	AUTOMATIC TRANSFER SWITCH	EB	ENCLOSED CIRCUIT BREAKER	FN	FIRE ALARM AUDIBLE NOTIFICATION APPLIANCE
[Symbol]	LIGHTING FIXTURE	UPS	UN-INTERRUPTIBLE POWER SUPPLY	PS	PUSH BUTTON STATION	XX	FIRE ALARM VISUAL NOTIFICATION APPLIANCE
[Symbol]	EMERGENCY FIXTURE	CSX	LOW VOLTAGE CONTROL STATION "X" INDICATES TYPE	JB	JUNCTION BOX	XX	"XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
[Symbol]	DIRECTIONAL LIGHTING FIXTURE	⊕	SINGLE RECEPTACLE	HW	HARD WIRE POWER CONNECTION	XX	FIRE ALARM COMBINATION VISUAL/AUDIBLE "XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
[Symbol]	PENDANT LIGHTING FIXTURE	⊕	DUPLEX RECEPTACLE	AC	AUTOMATIC DOOR CONTROLLER	XX	FIRE ALARM COMBINATION VISUAL/AUDIBLE NOTIFICATION APPLIANCE - CEILING MOUNTED
[Symbol]	WALL SCONCE	⊕	QUAD RECEPTACLE	ADO	AUTOMATIC DOOR PUSH PAD OPERATOR	XX	"XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
[Symbol]	LIGHTING TRACK	⊕	ABOVE COUNTER DUPLEX RECEPTACLE (SIMILAR FOR TAMPER RESISTANT, QUADS, EMERGENCY AND GFI RECEPTABLES)	GR	GROUND ROD	XX	FIRE ALARM VISUAL NOTIFICATION APPLIANCE - CEILING MOUNTED
[Symbol]	TRACK LIGHTING FIXTURE	⊕	DUPLEX RECEPTACLE-GROUND FAULT CIRCUIT INTERRUPTER	GC	GROUND CONNECTION	XX	"XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
[Symbol]	POLE MOUNTED LIGHTING FIXTURE	⊕	DUPLEX EMERGENCY RECEPTACLE	CS	CONDUIT SLEEVE WITH BUSHINGS LENGTH AS REQUIRED	XX	FIRE ALARM VISUAL NOTIFICATION APPLIANCE
[Symbol]	POLE MOUNTED LIGHTING FIXTURE - POST TOP	⊕	TAMPER RESISTANT RECEPTACLE	CI	CONDUIT UP	XX	"XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
[Symbol]	BOLLARD LIGHTING FIXTURE	⊕	QUAD TAMPER RESISTANT RECEPTACLE	CD	CONDUIT DOWN	XX	FIRE ALARM VISUAL NOTIFICATION APPLIANCE
[Symbol]	EMERGENCY LIGHTING UNIT	⊕	ABOVE COUNTER DUPLEX TAMPER RESISTANT RECEPTACLE	CU	CONDUIT TERMINATION	XX	"XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
[Symbol]	EXIT LIGHTING FIXTURE WITH DIRECTIONAL ARROWS (SHADED AREA INDICATES FACE)	⊕	DUPLEX UPS RECEPTACLE	CT	CURRENT TRANSFORMER	XX	FIRE ALARM VISUAL NOTIFICATION APPLIANCE
[Symbol]	EXIT LIGHTING FIXTURE WITH DIRECTIONAL ARROWS (SHADED AREA INDICATES FACE)	⊕	USB RECEPTACLE	PT	POTENTIAL TRANSFORMER	XX	"XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
[Symbol]	EXIT LIGHTING FIXTURE - WALL MOUNTED	⊕	CEILING MOUNTED DUPLEX RECEPTACLE	LA	LIGHTNING ARRESTOR	XX	FIRE ALARM VISUAL NOTIFICATION APPLIANCE
[Symbol]	EMERGENCY LOAD TRANSFER DEVICE	⊕	SPECIAL RECEPTACLE - REFER TO ELECTRICAL STANDARD SCHEDULES	FA	FIRE ALARM CONTROL PANEL	XX	"XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
S	SINGLE POLE TOGGLE SWITCH	⊕	MULTI-OUTLET RACEWAY	FAA	FIRE ALARM ANNUNCIATOR PANEL		
S2	TWO POLE TOGGLE SWITCH	⊕	MULTI-SERVICE DROP	NAC	NOTIFICATION APPLIANCE CIRCUIT EXTENDER PANEL		
S3	3 WAY TOGGLE SWITCH	⊕	SEE ELECTRICAL DETAILS AND DIAGRAMS SHEET "X" INDICATES TYPE	IM	ADDRESSABLE MONITORING MODULE		
S4	4 WAY TOGGLE SWITCH	⊕	POKE THRU SERVICE FITTING "X" INDICATES TYPE	DM	ADDRESSABLE CONTROL MODULE		
K	KEY OPERATED SWITCH	⊕	FLOOR BOX SERVICE FITTING "X" INDICATES TYPE	TS	TAMPER SWITCH		
K3	3 WAY KEY OPERATED SWITCH	⊕	ACCESS FLOOR SERVICE FITTING "X" INDICATES TYPE	FS	FLOW SWITCH		
K4	4 WAY KEY OPERATED SWITCH	⊕	CORD REEL "X" INDICATES TYPE	DR	MAGNETIC DOOR RELEASE		
D	DIMMER SWITCH	⊕	DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES				
D3	3 WAY DIMMER SWITCH	⊕	3-WAY DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES				
SP	PILOT SWITCH	⊕	4-WAY DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES				
		⊕	DIGITAL TIME SWITCH				
		⊕	ILLUMINATED TOGGLE SWITCH FOR CONTROL OF LIGHTING ON CRITICAL POWER-ILLUMINATED WHEN SWITCH IS IN "OFF" POSITION				
		⊕	LOW VOLTAGE SWITCH				
		⊕	OCCUPANCY SENSOR				
		⊕	OCCUPANCY SENSOR REFER TO ELECTRICAL STANDARD SCHEDULES				
		⊕	OCCUPANCY SENSOR "X" INDICATES TYPE				
		⊕	MUSIC/DISASTER SPEAKER				
			TELECOMMUNICATION BACKBOARD				
			TELECOMMUNICATION GROUNDING BUS BAR				
			TELECOMMUNICATION MAIN GROUNDING BUS BAR				
			INTERCOM OUTLET				
			HOSPITAL PAGING SPEAKER				
			SPEAKER - WALL MOUNTED				
			MICROPHONE				
			VOLUME CONTROL/STATION SELECTOR				
			SIGNALING BELL				
			SINGLE FACE CLOCK - CEILING MOUNTED				
			SINGLE FACE CLOCK - WALL MOUNTED				
			DOUBLE FACE CLOCK - CEILING MOUNTED				
			DOUBLE FACE COMBINATION CLOCK/SPEAKER CEILING MOUNTED				
			DOUBLE FACE CLOCK - WALL MOUNTED				
			DOUBLE FACE COMBINATION CLOCK/SPEAKER WALL MOUNTED				
			TIME CLOCK				
			PHOTOCELL				
			PHOTOCALL				
			TWIST TIMER				

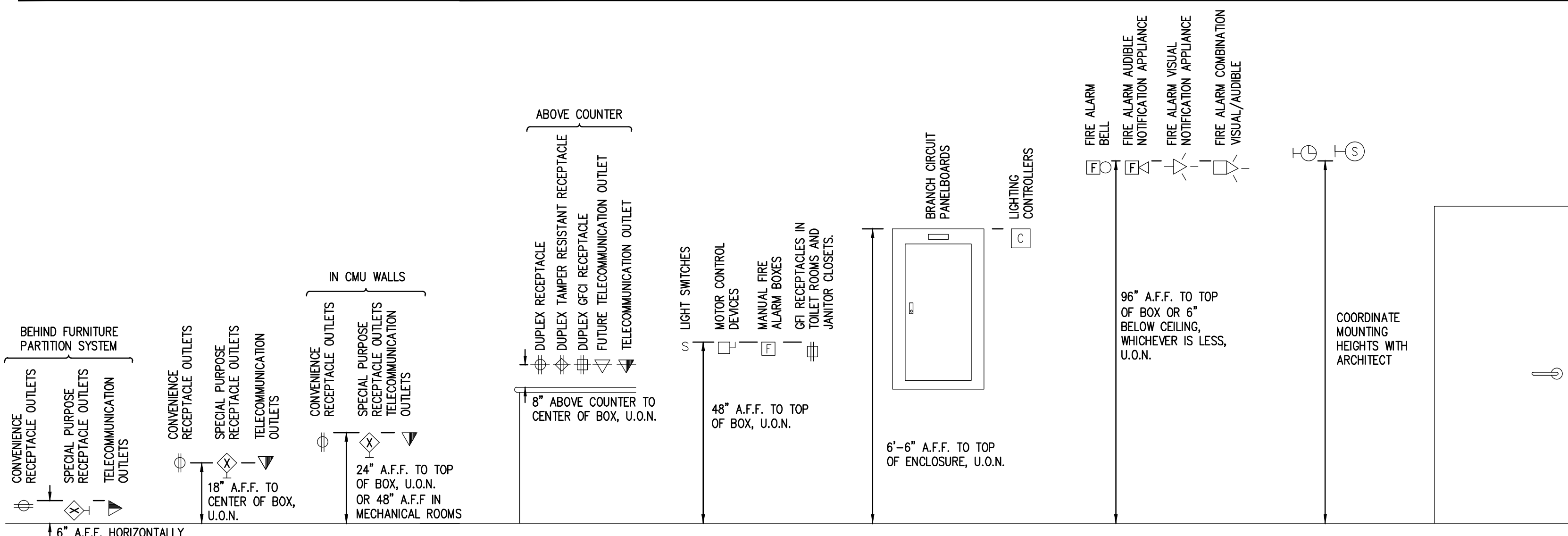
ELECTRICAL DRAWING INDEX

SHEET NO.	SHEET TITLE
E0.1	ELECTRICAL STANDARDS AND DRAWING INDEX
E0.2	ELECTRICAL STANDARD SCHEDULES
E0.3	ELECTRICAL SITE PLAN
E2.0	BASEMENT FLOOR ELECTRICAL PLAN
E2.3	THIRD FLOOR ELECTRICAL PLAN
E2.4	FOURTH FLOOR ELECTRICAL PLAN
E2.5	FIFTH FLOOR ELECTRICAL PLAN
E2.6	PENTHOUSE ELECTRICAL PLAN
E4.0	ENLARGED ELECTRICAL PLAN
E4.1	ENLARGED ELECTRICAL PLAN
E5.1	ONE LINE DIAGRAM
E5.2	PANEL SCHEDULES
E7.1	ELECTRICAL DETAILS AND DIAGRAMS

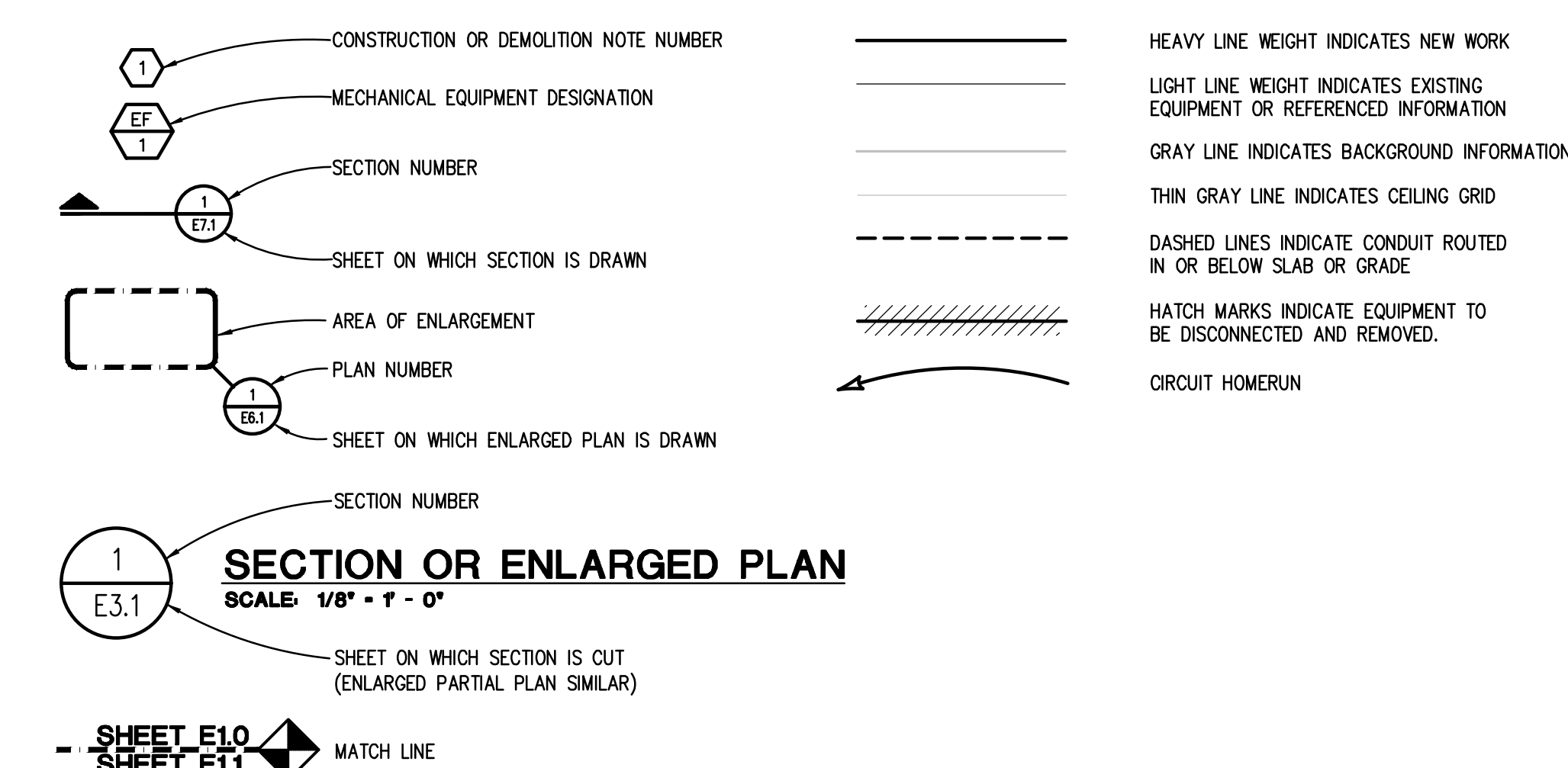
ELECTRICAL ABBREVIATION LIST

ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
A	AMPERES	OC	ON CENTER	OC	ON CENTER
AF	AMPERES FRAME (BREAKER RATING)	OCFI	OWNER FURNISHED, CONTRACTOR INSTALLED	OCFI	OWNER FURNISHED, CONTRACTOR INSTALLED
A.F.F.	ABOVE FINISH FLOOR	OFCA	OWNER FURNISHED, OWNER INSTALLED	OFCA	OWNER FURNISHED, OWNER INSTALLED
AIC	AMPS INTERRUPTING CAPACITY	HP	HAND-OFF-AUTO	HP	HAND-OFF-AUTO
AL	AUDIENCE LEFT	HV	HIGH VOLTAGE	HV	HIGH VOLTAGE
AR	AUDIENCE RIGHT	HZ	HERTZ	HZ	HERTZ
ATS	AMPERES TRIP (BREAKER SETTING)	IG	ISOLATED GROUND	IG	ISOLATED GROUND
AUX	AUTOMATIC TRANSFER SWITCH	IB	JUNCTION BOX	IB	JUNCTION BOX
BRR	AUXILIARY	JB	JUNCTION BOX	JB	JUNCTION BOX
BPS	BOLTED PRESSURE SWITCH	KV	KILOVOLT	KV	KILOVOLT
C	BREAKER	KVA	KILOVOLT - AMPERES	KVA	KILOVOLT - AMPERES
CB	CONDUIT	KW	KILOWATT	KW	KILOWATT
CF	CIRCUIT BREAKER	KWH	KILOWATT - HOURS	KWH	KILOWATT - HOURS
CFI	CIRCUIT BREAKER CONTRACTOR FURNISHED, CONTRACTOR INSTALLED	LA	LIGHTNING ARRESTOR	LA	LIGHTNING ARRESTOR
CKT	CIRCUIT	LP	LIGHTING PANEL	LP	LIGHTING PANEL
DEM	DEMOLITION	LD	LIGHTING DISTRIBUTION PANEL	LD	LIGHTING DISTRIBUTION PANEL
DM	DIMENSION	MAX	MAXIMUM	MAX	MAXIMUM
DISC	DISCONNECT	MCS	MAIN CIRCUIT BREAKER	MCS	MAIN CIRCUIT BREAKER
DP	DISTRIBUTION PANEL	MCC	MOTOR CONTROL CENTER	MCC	MOTOR CONTROL CENTER
DS	DOWNSHAFT	MCP	MAIN DISTRIBUTION PANEL	MCP	MAIN DISTRIBUTION PANEL
ENG	ENGINEERING	MECH	MECHANICAL	MECH	MECHANICAL
EBU	EMERGENCY BATTERY UNIT	MIN	MINIMUM	MIN	MINIMUM
EC	ELECTRICAL CONTRACTOR	MISC.	MISCELLANEOUS	MISC.	MISCELLANEOUS
ELEC	ELECTRICAL	MLO	MAIN LUGS ONLY MOUNTED	MLO	MAIN LUGS ONLY MOUNTED
EMV/EMERG	EMERGENCY ELECTRICAL METALLIC TUBING	MTD	MOUNTING	MTD	MOUNTING
EMT	ELECTRICALLY OPERATED	MTR	MOTOR	MTR	MOTOR
EPO	EMERGENCY POWER OFF	N	NEUTRAL	N	NEUTRAL
EXIST	EXISTING	NC	NORMALLY CLOSED	NC	NORMALLY CLOSED
FA	FIRE ALARM	NEC	NATIONAL ELECTRICAL CODE	NEC	NATIONAL ELECTRICAL CODE
FLA	FULL LOAD AMPS	NF	NON-FUSIBLE	NF	NON-FUSIBLE
FLR	FLOOR	NIC	NOT IN CONTRACT	NIC	NOT IN CONTRACT
FOH	FRONT OF HOUSE	NL	NIGHT LIGHT	NL	NIGHT LIGHT
FU	FUSE	NO	NORMALLY OPEN	NO	NORMALLY OPEN
		NTS	NOT TO SCALE	NTS	NOT TO SCALE

STANDARD MOUNTING HEIGHTS



STANDARD METHODS OF NOTATION



PROJECT TITLE: WSU 603 - COLLEGE OF PHARMACY ELECTRICAL RELIABILITY UPGRADE
 SHEET TITLE: ELECTRICAL STANDARDS AND DRAWING INDEX
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Peter Basco Associates Inc. CONSULTING ENGINEERS



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

* = SEE NOTE 4

NOTES:

- CONTRACTOR TO SIZE FEEDERS AND BRANCH CIRCUITS BASED ON THIS SCHEDULE AND OVER CURRENT DEVICE SIZE, UNLESS NOTED OTHERWISE.
- CONTRACTOR MAY COMBINE 20A CIRCUITS AS NOTED IN SPECIFICATION.
- CONDUCTORS ARE BASED ON THHN/THWN UP TO AND INCLUDING #4/0. LARGER THAN #4/0 ARE BASED ON TYPE XHHW.
- CONDUCTORS ARE BASED ON 90°C, 600V INSULATED COPPER WIRE APPLIED AT 75°C FOR TERMINATION RATED 60/75°C OR 75°C FOR TERMINATION RATED AT 60°C. USE CONDUCTORS AND CONDUIT SIZES INDICATED IN PARENTHESES.
- CONDUIT SIZES ARE VALID FOR EMT OR RGS. CONDUIT SIZES SHALL BE ADJUSTED AS REQUIRED FOR OTHER TYPES OF CONDUIT.
- ELECTRICAL CONTRACTOR TO COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE REQUIRED WIRE SIZES TO ACCOMMODATE MECHANICAL EQUIPMENT LUG SIZES.
- SIZE OF DISCONNECT SWITCH LOCATED AT EQUIPMENT SHALL BE SIZED BASED UPON OVERCURRENT PROTECTION OF THAT DEVICE.
- PRIOR APPROVAL FROM ENGINEER SHALL OCCUR IF A DIFFERENT SIZE/NUMBER OF CONDUCTORS IS TO BE USED. AMPACITY SHALL BE EQUAL OR GREATER.

DRY TYPE DISTRIBUTION TRANSFORMER CIRCUIT SIZING SCHEDULE						
TRANSFORMER KVA	PRIMARY (480V)	CIRCUIT BREAKER (NOTE 4)	SECONDARY (208Y/120 VOLT)			GROUNDING ELECTRODE CONDUCTOR
			CIRCUIT BREAKER	BRANCH CIRCUIT SIZE (AWG OR KCMIL)	CONDUIT (4W + G)	
9	20A	30A	10	#8	3/4"	#8
15	25A	60A	6	#8	3/4"	#8
30	45A	100A	3	#8	1 1/4"	#8
45	70A	175A	2/0	#4	2"	#4
75	125A	300A/225A**	350 / 4/0**	#2	3"	#2
112 1/2	175A	400A	600	#1/0	3 1/2"	#1/0
150	225A	600A	2-350	#2/0	2-3"	#2/0
225	350A	800A	2-600	#3/0	2-3 1/2"	#3/0
300	500A	1200A	3-600	#3/0	3-3 1/2"	#3/0
500	800A	1600A	4-600	#3/0	4-3 1/2"	#3/0

* = SEE NOTE 3 ** = SEE NOTE 4

NOTES:

- TRANSFORMERS AND FEEDERS ARE BASED ON 480 VOLT, 3 PHASE, 3 WIRE PRIMARY AND 208Y/120 VOLT, 3 PHASE, 4 WIRE, SECONDARY.
- FEEDERS INDICATED ARE BASED ON COPPER CONDUCTORS. IF ALUMINUM CONDUCTORS ARE PERMITTED AND SELECTED, FEEDER SIZES SHALL BE PER THE NEC.
- CONDUCTORS ARE BASED ON 90°C, 600V INSULATED COPPER WIRE APPLIED AT 75°C FOR TERMINATION RATED 60/75°C OR 75°C.
- THE SMALLER SIZE IS TO BE USED TO FEED 225A PANELBOARDS.
- PRIMARY OVERCURRENT PROTECTION IS SIZED AT 125% OF TRANSFORMER FULL LOAD CURRENT. PROVIDE PRIMARY OVERCURRENT DEVICE SELECTION TO ALLOW TRANSFORMER IN-RUSH CURRENT AND PROTECT BASED ON THE ANSI DAMAGE CURVE. IF MANUFACTURER REQUIRES PRIMARY OVERCURRENT GREATER THAN 125% (NOT TO EXCEED 250%) THEN PRIMARY FEEDER SHALL BE INCREASED ACCORDINGLY.

SPECIAL RECEPTACLES	
TYPE	DESCRIPTION
◇	125V, 30A, SINGLE PHASE, LOCKING RECEPTACLE, 2 POLE, 3 WIRE (NEMA L5-30R)
◇	250V, 20A, SINGLE PHASE, LOCKING RECEPTACLE, 2 POLE, 3 WIRE (NEMA L6-20R)
◇	250V, 30A, SINGLE PHASE, LOCKING RECEPTACLE, 2 POLE, 3 WIRE (NEMA L6-30R)
◇	250V, 20A, THREE PHASE, LOCKING RECEPTACLE, 3 POLE, 4 WIRE (NEMA L15-20R)
◇	250V, 30A, THREE PHASE, LOCKING RECEPTACLE, 3 POLE, 4 WIRE (NEMA L15-30R)
◇	208Y/120V, 30A, THREE PHASE, LOCKING RECEPTACLE, 4 POLE, 5 WIRE (NEMA L21-30R)
◇	125/ 250V SINGLE PHASE RECEPTACLE, 3 POLE, 4 WIRE (NEMA 14-30R)
◇	125/ 250V SINGLE PHASE RECEPTACLE, 3 POLE, 4 WIRE (NEMA 14-50R)

BRANCH CIRCUIT VOLTAGE DROP WIRING SCHEDULE FOR SINGLE PHASE CIRCUITS						
BRANCH CRT RATING (A)	WIRE SIZE (AWG)	MAXIMUM BRANCH CIRCUIT LENGTH (IN FEET)				
		120V	208V	240V	277V	480V
20A	12	63	143	165	191	331
	10	128	222	256	295	511
	8	201	348	402	464	804
	6	313	542	625	721	1250
30A	10	85	148	170	197	341
	8	134	232	268	309	536
	6	208	361	417	481	833
	4	313	542	625	721	1250

NOTES:

- THE ABOVE TABLE VALUES ARE BASED ON COPPER CONDUCTORS, IN STEEL CONDUIT, WITH A LOAD POWER FACTOR OF 0.85 PER NEC CHAPTER 9, TABLE 9.
- PROVIDE BRANCH CIRCUIT CONDUCTORS AS INDICATED IN THE TABLE ABOVE FOR ALL LIGHTING AND RECEPTACLE BRANCH CIRCUITS. WHERE BRANCH CIRCUITS SERVE DEDICATED EQUIPMENT, THE CONTRACTOR MAY PERFORM VOLTAGE DROP CALCULATIONS BASED ON ACTUAL EQUIPMENT CONNECTED LOAD AND PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO A MAXIMUM OF 3%.
- CONDUCTOR SIZES ARE BASED ON MAXIMUM OF 9 CURRENT CARRYING CONDUCTORS IN A SINGLE CONDUIT.
- LIMITS FOR CONDUCTOR LENGTHS SHOWN ARE BASED ON A MAXIMUM BRANCH CIRCUIT LOADING OF 64% OF THE BRANCH BREAKER RATING AND A MAXIMUM OF 3 PERCENT VOLTAGE DROP. TO COMPLY WITH ASHRAE/IES 90.1 - 1999 AND THE NEC, FOR CIRCUITS LOADED GREATER THAN 64% OF BRANCH BREAKER RATING, THE CONTRACTOR SHALL PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO 3%.

LIGHTING FIXTURE SCHEDULE			
TYPE	DESCRIPTION	MANUFACTURER	LAMPS
L1	LED WALL PACK LIGHT FIXTURE WITH DIE CAST ALUMINUM HOUSING, IMPACT-RESISTANT TEMPERED GLASS LENS THAT IS FULLY GASKETED, AND INTEGRAL PHOTOCCELL. FIXTURE SHALL BE DARK BRONZE FINISH. 120V OPERATION. TYPE 3 DISTRIBUTION AND FUSED.	1. LITHONIA TMM LED SERIES 2. PHILIPS WPM LED SERIES 3. COOPER WP SERIES	10 LEDs
L2	LED FLOOD LIGHT FIXTURE AND 20" HIGH SQUARE STEEL POLE. FLOOD LIGHT FIXTURE TO HAVE DIE CAST ALUMINUM HOUSING, FULLY GASKETED LENS ON HINGED DOOR FRAME AND INTEGRAL PHOTOCCELL. FIXTURE TO BE MOUNTED ON TOP OF POLE. POLE AND FIXTURE SHALL HAVE DARK BRONZE FINISH. PROVIDE YOKE ON POLE TOP FOR MOUNTING THE TWO FIXTURES. 120V OPERATION.	1. INVUE VFS SERIES 2. WIDELIGHT UF3 SERIES 3. CARDICO DLF SERIES	40 LEDs (70mA)

TELECOMMUNICATIONS OUTLET SCHEDULE			
TAG	DESCRIPTION	TYPE	REMARKS
A1	1 DATA	1 CAT5e	
A2	1 VOICE	1 CAT5e	
A3	1 DATA + 1 VOICE	2 CAT5e	
A4	2 DATA	2 CAT5e	
A5	2 DATA + 1 VOICE	3 CAT5e	
A6	2 DATA, 2 VOICE, 2 SMF, 2MMF	4 CAT5e, 2 SMF, 2 MMF	
A7	3 DATA	3 CAT5e	
A8	3 DATA + 1 VOICE	4 CAT5e	
A9	4 DATA	4 CAT5e	
A10	6 DATA	6 CAT5e	
BX	EXISTING OUTLET TO BE RECALLED. SIMILAR TO "A" OUTLETS ABOVE.		PROVIDE NEW CONNECTORS AND FACEPLATE.
C1	A COAX	1 RG6	
C2	1 COAX + 1 DATA	1 RG6, 1 CAT5e	
C3	1 COAX, 1 DATA, 1 SVHS	1 RG6, 1 CAT5e, 1 SVHS	

- ▽ EMPTY BOX W/ CONDUIT FOR FUTURE TELECOM OUTLET
- XX TELECOM OUTLET. PROVIDE CABLE PER SCHEDULE ABOVE.
- XX(ETX) TELECOM OUTLET TO BE PROVIDED IN FLOOR SERVICE FITTING. PROVIDE CABLE PER SCHEDULE ABOVE.
- XX(PTX) TELECOM OUTLET TO BE PROVIDED IN POKE-THRU ASSEMBLY. PROVIDE CABLE PER SCHEDULE ABOVE.

RACEWAY APPLICATION SCHEDULE						KEYED NOTES	
RACEWAY		ELECTRICAL METALLIC TUBING (EMT)	SURFACE RACEWAY	FLEXIBLE METAL CONDUIT (FMC)	LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)		RIGID STEEL CONDUIT (RSC)
INDOOR	EXPOSED NOT SUBJECT TO PHYSICAL DAMAGE - UNFINISHED SPACES					X	
INDOOR	EXPOSED NOT SUBJECT TO PHYSICAL DAMAGE - FINISHED SPACES	X					
INDOOR	CONCEALED IN CEILINGS, INTERIOR WALL AND PARTITIONS	X			X		
INDOOR	CONNECTED TO VIBRATING EQUIPMENT			X	X		
INDOOR	DAMP AND WET LOCATIONS					X	
INDOOR	EXPOSED UNDERGROUND						X X
INDOOR	CONNECTED TO VIBRATING EQUIPMENT						X X

- GENERAL NOTES:
- 'X' INDICATES ACCEPTABLE SELECTION.
 - REFER TO "CONDUCTORS AND CABLES" SPECIFICATION FOR APPLICATION LIMITATIONS OF AC/MC CABLE.

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

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PROJECT TITLE
WSU 603 - COLLEGE OF PHARMACY
ELECTRICAL RELIABILITY
UPGRADE
WSU Project No.: 603-243264
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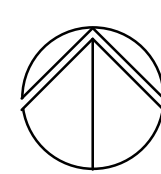
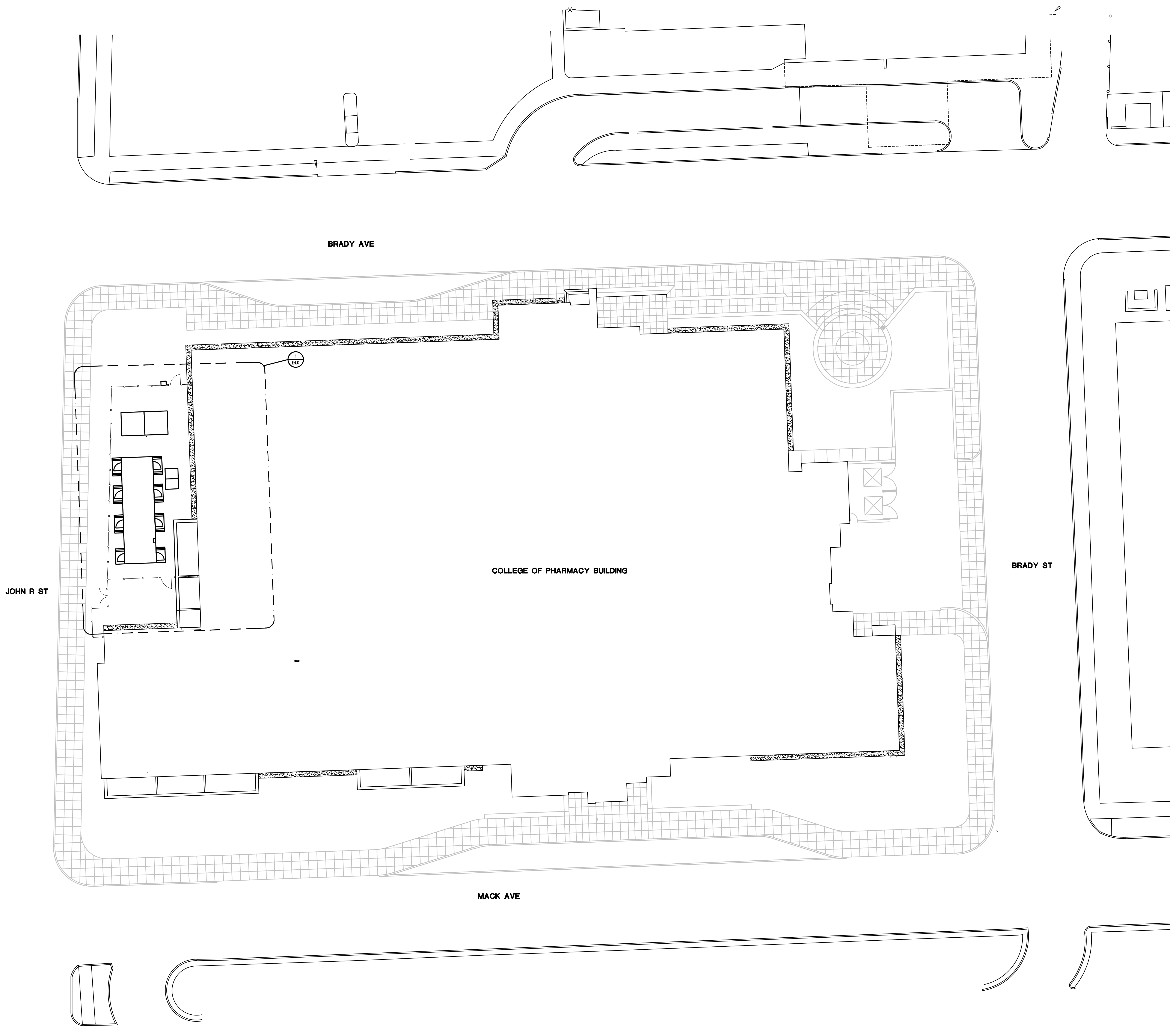
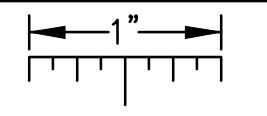
SHEET TITLE
ELECTRICAL STANDARD
SCHEDULES

DATE
8/26/2014

ISSUE
BIDS

SHEET No.
E02

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



ELECTRICAL SITE PLAN
SCALE: 1/16" = 1' - 0"

REVISION

REVISION

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PBA Project No.: 2014050700



PROJECT TITLE
WSU 603 - COLLEGE OF PHARMACY
ELECTRICAL RELIABILITY
UPGRADE
WSU Project No.: 603-243264
Detroit, MI 48202

WAYNE STATE UNIVERSITY

SHEET TITLE
ELECTRICAL SITE PLAN

DATE
8/26/2014

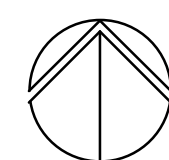
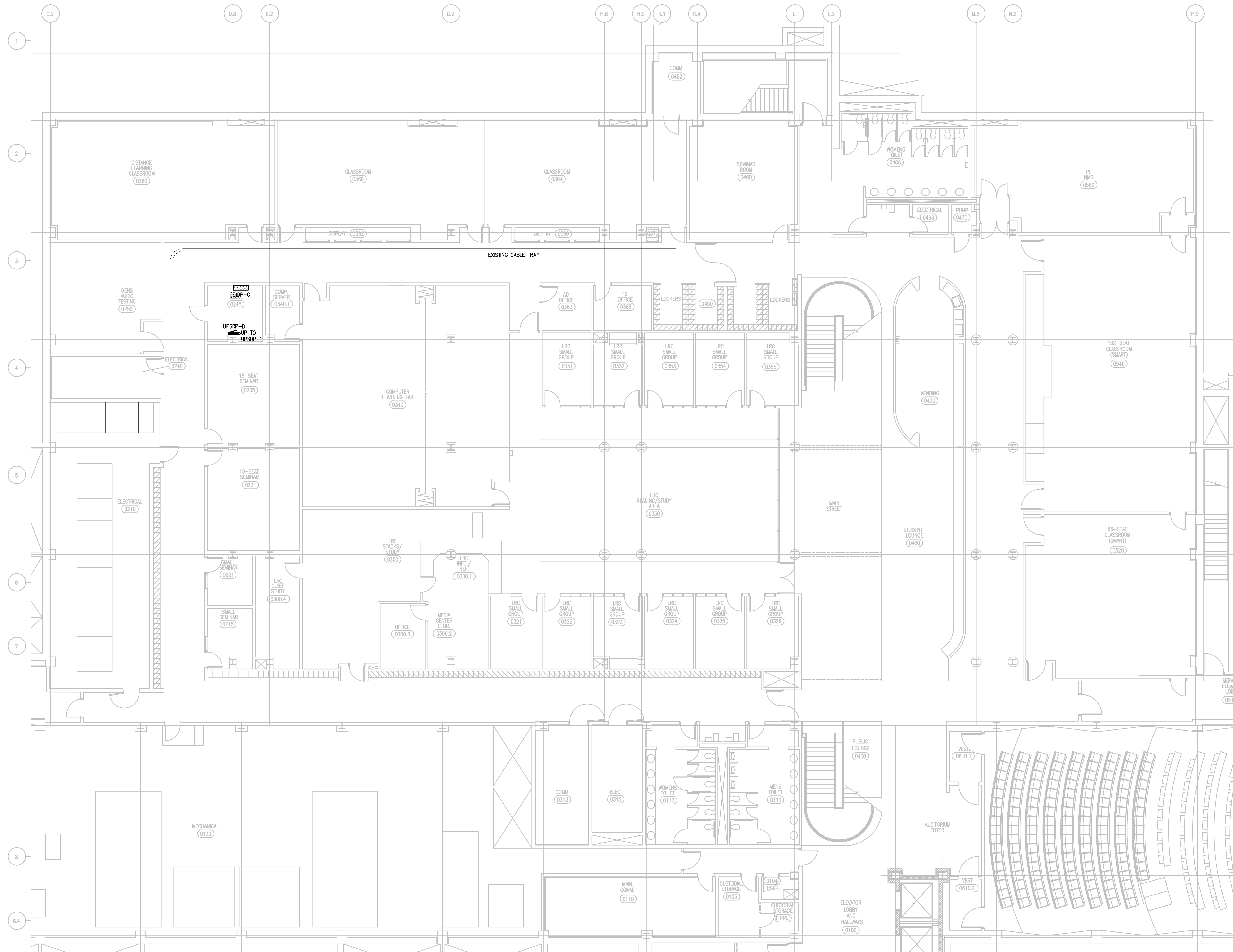
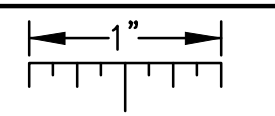
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SHEET No.

E0.3

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THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



BASEMENT FLOOR ELECTRICAL PLAN
SCALE: 1/8" = 1' - 0"

GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS, BUT ARE NOT TO BE CONSIDERED FABRICATION DRAWINGS. COORDINATE WITH OTHER TRADES, AND PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS, AND OFFSETS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS.
4. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
5. TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
6. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
7. REMOVE AND REPLACE CEILING TILES AS REQUIRED TO INSTALL CONDUIT. REPLACE DAMAGED CEILING TILES.

CONSTRUCTION KEY NOTES:

1. PROPOSED ROUTING OF PANELBOARD FEEDERS. COORDINATE ROUTING WITH EXISTING FIELD CONDITIONS. TYPICAL CORRIDOR CEILING ARE LAY-IN TYPE. REMOVE AND REPLACE CEILING TILES AS REQUIRED TO INSTALL CONDUIT. REPLACE DAMAGED CEILING TILES.
2. PROVIDE CORING AS REQUIRED TO ACCOMMODATE NEW FEEDER PENETRATION THROUGH FLOOR.
3. OWNER TO REKEY/RECORE DOOR HARDWARE TO MATCH EXISTING ELECTRICAL ROOMS WITH IN THE BUILDING.
4. REMOVE ATS ANNUNCIATOR PANEL. COORDINATE EXACT LOCATION WITH OWNER.
5. REMOVE GEN-1 ANNUNCIATOR PANEL. COORDINATE EXACT LOCATION WITH OWNER.
6. SIEMENS GENERATOR DIESEL FUEL METER. COORDINATE WITH SIEMENS DRAWINGS FOR EXACT REQUIREMENTS. COORDINATE WITH OWNER ON EXACT LOCATION.

REVISION

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PROJECT TITLE
**WSU 603 - COLLEGE OF PHARMACY
ELECTRICAL RELIABILITY
UPGRADE**
WSU Project No.: 603-243264
Detroit, MI 48202

**WAYNE STATE
UNIVERSITY**

SHEET TITLE
**BASEMENT FLOOR
ELECTRICAL PLAN**

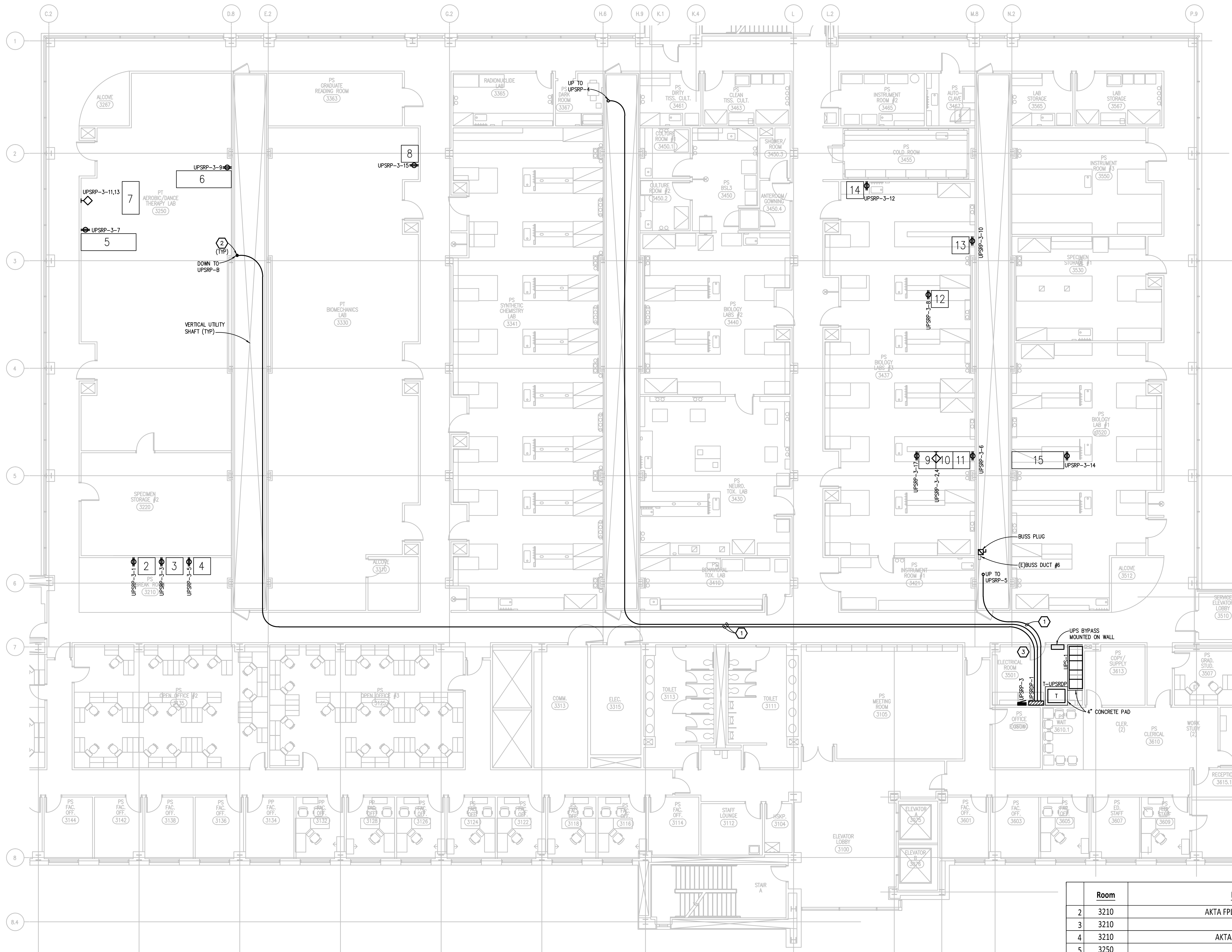
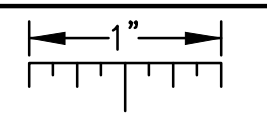
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8/26/2014
ISSUE
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SHEET No.

E2.0

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THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



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	Room	Equipment	Voltage	Amps	VA
2	3210	AKTA FPLC Academic Edition	120	3	360
3	3210	AKTA FPLC	120	7.5	900
4	3210	AKTA FPLC Prime Plus	120	1	90
5	3250	ITC/DSC	120	12	1440
6	3250	CD AND COMPUTER	120	3	360
7	3250	UV/Vis Spectrometer	240	5	1200
8	3330	GCMS Instrument	120	3	360
9	3437	Micro pump - Ultimate 3000	120	5	600
10	3437	Auto-Sampler - Ultimate 3000 Analytical Split loop	220	5	1100
11	3437	Coulochem III Electrochemical Detector	120	3	360
12	3437	GPC Max	120	3	360
13	3437	DSC Q2000	120	3	360
14	3437	Freeze Dryer/Iyophilizer	120	4	480
15	3520	Real Time PCR System	120	3	360

THIRD FLOOR ELECTRICAL PLAN
SCALE: 1/8" = 1'-0"

REVISION

REVISION

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Peter Basso Associates Inc.
CONSULTING ENGINEERS

PROJECT TITLE
**WSU 603 - COLLEGE OF PHARMACY
ELECTRICAL RELIABILITY
UPGRADE**

WSU Project No.: 603-243264
Detroit, MI 48202

**WAYNE STATE
UNIVERSITY**

SHEET TITLE
**THIRD FLOOR ELECTRICAL
PLAN**

DATE
8/26/2014

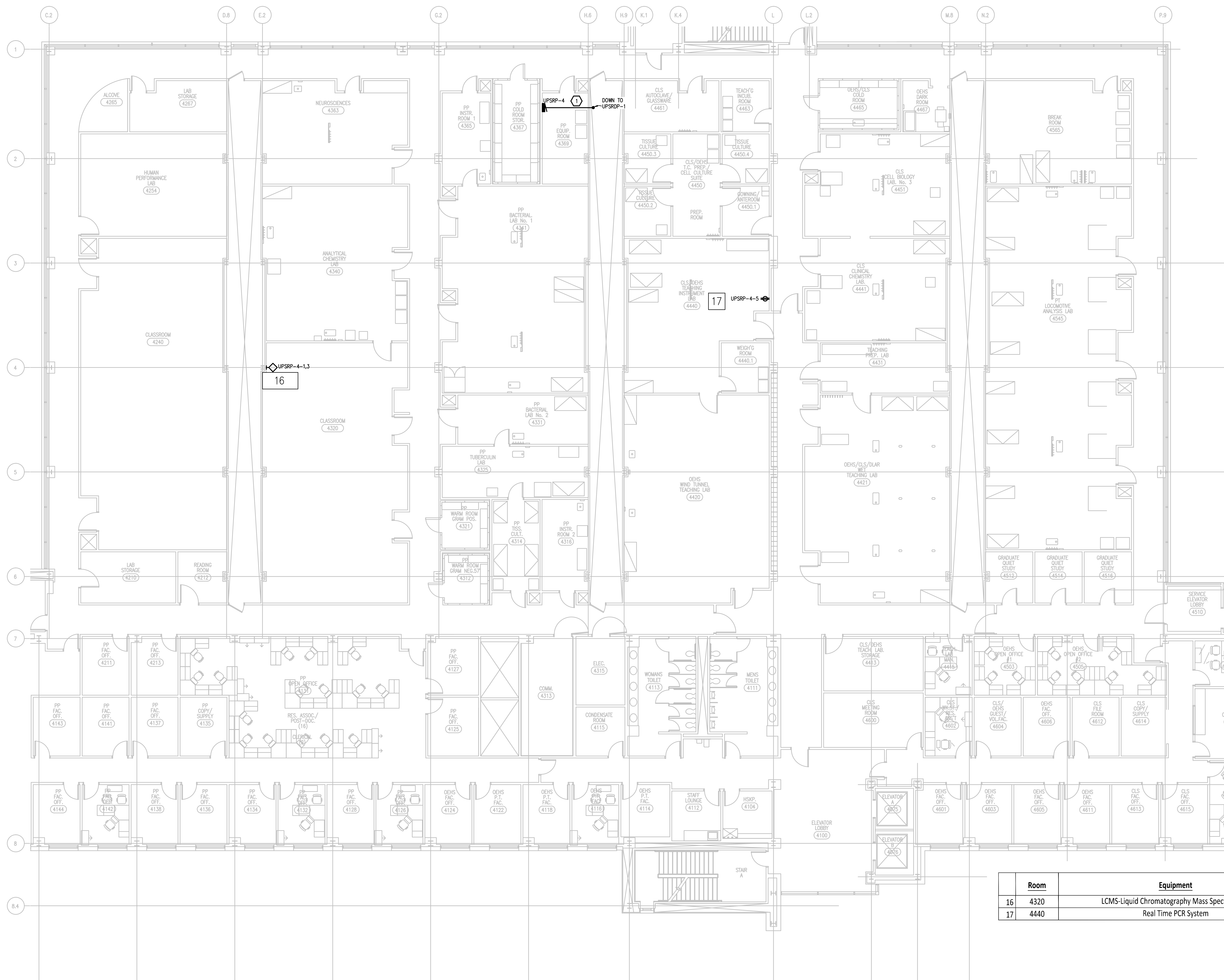
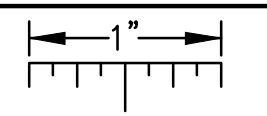
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SHEET No.

E2.3

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THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



Room	Equipment	Voltage	Amps	VA
16	4320 LCMS-Liquid Chromatography Mass Spectroscopy	240	5	1200
17	4440 Real Time PCR System	120	3	360

GENERAL NOTES:

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CONSTRUCTION KEY NOTES:

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REVISION

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Peter Basso Associates Inc.
CONSULTING ENGINEERS

PROJECT TITLE
WSU 603 - COLLEGE OF PHARMACY
ELECTRICAL RELIABILITY
UPGRADE

WSU Project No.: 603-243264
Detroit, MI 48202

WAYNE STATE UNIVERSITY

SHEET TITLE
FOURTH FLOOR ELECTRICAL PLAN

DATE
8/26/2014

ISSUE
BIDS

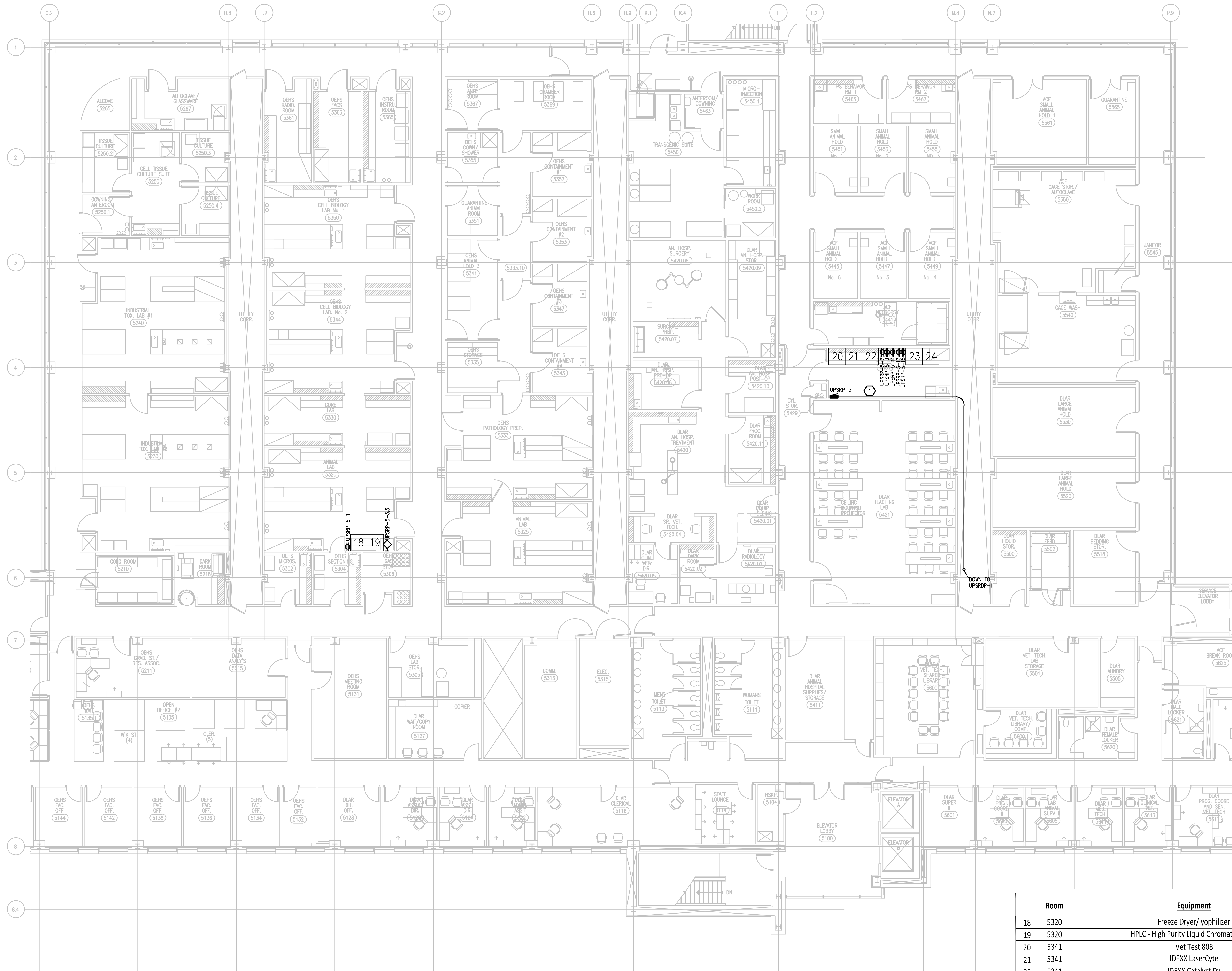
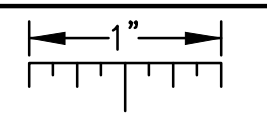
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E2.4

FOURTH FLOOR ELECTRICAL PLAN
SCALE: 1/8" = 1'-0"

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THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



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- REMOTE GEN-1 ANNUNCIATOR PANEL. COORDINATE EXACT LOCATION WITH OWNER.
- SIEMENS GENERATOR DIESEL FUEL METER. COORDINATE WITH SIEMENS DRAWINGS FOR EXACT REQUIREMENTS. COORDINATE WITH OWNER ON EXACT LOCATION.

Room	Equipment	Voltage	Amps	VA	
18	5320	Freeze Dryer/lyophilizer	120	4	480
19	5320	HPLC - High Purity Liquid Chromatography	208	9.5	1976
20	5341	Vet Test 808	120	5	600
21	5341	IDEXX LaserCyte	120	3	360
22	5341	IDEXX Catalyst Dx	120	3	360
23	5341	Heska CBC Diff (Veterinary Hematology System)	120	3	360
24	5341	Heska DRI-Chem 4000	120	3	360

FIFTH FLOOR ELECTRICAL PLAN
SCALE: 1/8" = 1' - 0"

REVISION

REVISION

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PBA Project No.: 2014050701

Peter Basso Associates Inc.
CONSULTING ENGINEERS

PROJECT TITLE
**WSU 603 - COLLEGE OF PHARMACY
ELECTRICAL RELIABILITY
UPGRADE**

WSU Project No.: 603-243264
Detroit, MI 48202

**WAYNE STATE
UNIVERSITY**

SHEET TITLE
**FIFTH FLOOR ELECTRICAL
PLAN**

DATE

8/26/2014

ISSUE

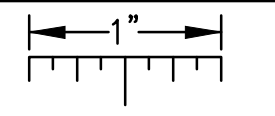
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E2.5

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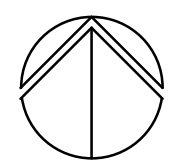


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CONSTRUCTION KEY NOTES:

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PENTHOUSE ELECTRICAL PLAN
SCALE: 1/8" = 1' - 0"

REVISION

REVISION

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PBA Project No.: 2014030701

Peter Basso Associates Inc.
CONSULTING ENGINEERS

PROJECT TITLE
**WSU 603 - COLLEGE OF PHARMACY
ELECTRICAL RELIABILITY
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WSU Project No.: 603-243264
Detroit, MI 48202

**WAYNE STATE
UNIVERSITY**

SHEET TITLE
**PENTHOUSE ELECTRICAL
PLAN**

DATE
8/26/2014

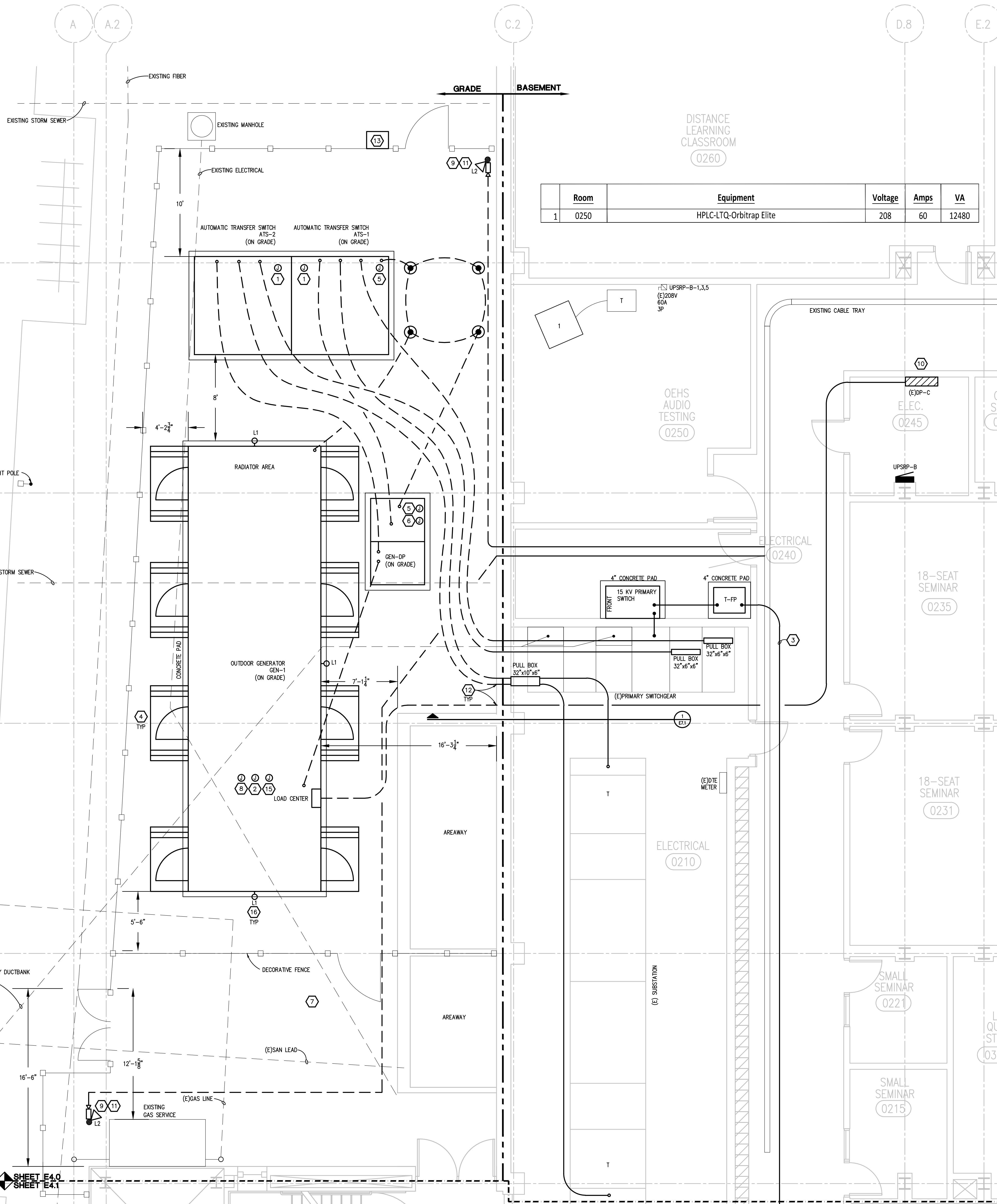
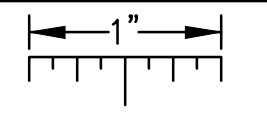
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SHEET No.

E2.6

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THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



Room	Equipment	Voltage	Amps	VA
1 0250	HPLC-LTQ-Orbitrap Elite	208	60	12480

GENERAL NOTES:

- THESE NOTES ARE GENERIC GUIDELINES ONLY. ELECTRICAL CONTRACTOR'S PERSONNEL ON SITE SHALL BE THOROUGHLY FAMILIAR WITH THE PUBLISHED SPECIFICATIONS FOR EXACT DESCRIPTIONS OF SCOPE, METHODS, AND MATERIAL.
- THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS, BUT ARE NOT TO BE CONSIDERED FABRICATION DRAWINGS. COORDINATE WITH OTHER TRADES, AND PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS, AND OFFSETS.
- CONDUCT A SURVEY TO IDENTIFY ALL UNDERGROUND UTILITIES. CALL 811 PRIOR TO EXCAVATION.
- UTILITIES SHOWN ON THESE DRAWINGS ARE FOR REFERENCE ONLY. EXACT LOCATION OF ALL EXISTING UTILITIES, AND ROUTING OF ALL NEW UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
- DEWATER TRENCHES PRIOR TO INSTALLATION OF CONDUITS. PROVIDE WATER TIGHT FITTINGS ON ALL UNDERGROUND CONDUITS.
- COORDINATE DEMOLITION WORK, AND ELECTRICAL AND TELEPHONE SERVICES TO THE SITE, WITH THE RESPECTIVE LOCAL UTILITY COMPANY REPRESENTATIVES PRIOR TO COMMENCEMENT OF WORK. INCLUDE ALL ASSOCIATED COSTS BY THE UTILITY COMPANIES IN THE BID PRICE.
- INSTALL UNDERGROUND CONDUITS 42" BELOW FINISHED GRADE, MINIMUM, UNLESS NOTED OTHERWISE.
- COORDINATE SERVICE SHUT-DOWNS WITH ALL TRADES INVOLVED ON SITE AND OBTAIN WRITTEN AUTHORIZATION FROM OWNER 72 HOURS PRIOR TO ANY ELECTRICAL AND/OR TELEPHONE SHUT-DOWN.
- REMOVE ALL DE-ENERGIZED CONDUCTORS FROM SITE AT COMPLETION OF THE PROJECT.
- OUTDOOR LIGHTING BRANCH CIRCUIT WIRING SHALL BE MINIMUM #8 AWG CONDUCTORS (XHHW), IN MINIMUM 1" DIA. CONDUIT, UNLESS NOTED OTHERWISE.
- SPARE CONDUITS SHALL INCLUDE PULL STRING AND SHALL BE TERMINATED WITH A CAP.
- EXCAVATE THE ENTIRE LENGTH OF TRENCH TO PROPERLY SET DUCT ELEVATIONS.

CONSTRUCTION KEY NOTES:

- PROVIDE 3/4" C FROM ATS TO REMOTE ATS ANNUNCIATOR PANEL LOCATED IN THE PENTHOUSE. REFER TO SHEET E2.6 FOR REMOTE ATS ANNUNCIATOR PANEL LOCATION.
- PROVIDE 3/4" C FROM GEN-1 TO REMOTE GEN-1 ANNUNCIATOR PANEL LOCATED IN THE PENTHOUSE. REFER TO SHEET E2.6 FOR REMOTE GEN-1 ANNUNCIATOR PANEL LOCATION.
- PROPOSED ROUTING OF (E)FIRE PUMP FEEDER. COORDINATE ROUTING WITH EXISTING FIELD CONDITIONS. TYPICAL CORRIDOR CEILING ARE LAY-IN TYPE. REMOVE AND REPLACE CEILING TILES AS REQUIRED TO INSTALL CONDUIT. REPLACE DAMAGED CEILING TILES.
- CUSTOM GALVANIZED STEEL STAIRS AND SERVICE PLATFORM. COORDINATE WITH GENERATOR MANUFACTURER.
- JUNCTION BOX FOR 120V CIRCUIT FOR STRIP HEATER. CIRCUIT TO SPARE BREAKER IN GEN-1 LOAD CENTER.
- JUNCTION BOX FOR 120V CIRCUIT FOR MEDIUM VOLTAGE CIRCUIT BREAKER CONTROL. CIRCUIT TO SPARE BREAKER IN GEN-1 LOAD CENTER.
- PROVIDE GROUND PENETRATING RADAR TO SURVEY EXISTING UNDERGROUND UTILITIES IN ENTIRE AREA AFFECTED BY THE PROJECT. HAND DIG NEAR EXISTING UTILITIES.
- PROVIDE 3/4" C FROM GEN-1 TO SIEMENS DIESEL FUEL LEVEL METER LOCATED IN THE PENTHOUSE. REFER TO SHEET E2.6 FOR SIEMENS DIESEL FUEL LEVEL METER LOCATION.
- NEW LIGHT POLE AND POLE MOUNTED SITE LIGHTING FIXTURE. SEE DETAIL ON SHEET E7.1 FOR POLE BASE REQUIREMENTS. FIXTURE TO BE CONTROLLED VIA INTEGRAL PHOTOCELL. PROVIDE CIRCUIT FROM GEN-1 LOAD CENTER.
- PROVIDE A NEW 100A 3P 208V CIRCUIT BREAKER IN AVAILABLE SPACE OF EXISTING DP-C FOR NEW GEN-1 LOAD CENTER.
- CAMERA JUNCTION BOX AT TOP OF NEW LIGHT POLE. CAMERA PROVIDED BY OWNER. PROVIDE 3/4" CONDUIT AND CAT6a WIRING FROM JUNCTION BOX TO EXISTING CABLE TRAY LOCATED IN THE BASEMENT CORRIDOR ABOVE THE CEILING. CAT6a WIRING TO CONTINUE IN EXISTING CABLE TRAY TO COMM ROOM 0462. REFER TO SHEET E2.0 FOR COMM ROOM 0462 LOCATION. ADJUST CAMERA IN FIELD AS REQUIRED.
- PROVIDE CORING OF EXTERIOR PRECAST WALL AS REQUIRED. PROVIDE SEAL TIGHT AND SEAL SPRAY.
- DIESEL GENERATOR LOADING/UNLOADING LOCKABLE REMOTE FILL STATION. REFER TO DETAIL ON SHEET E7.1.
- NEW BMS CONTROL PANEL EQUIPMENT, POWER WIRING AND CONTROL WIRING PROVIDED BY OTHERS.
- (1)CAT6a IN 1" C TO EXISTING CABLE TRAY IN BASEMENT CORRIDOR ABOVE THE CEILING. CAT6a WIRING TO CONTINUE IN EXISTING CABLE TRAY TO COMM ROOM 0462. REFER TO SHEET E2.0 FOR COMM ROOM 0462 LOCATION.
- INSTALL "1" LIGHT FIXTURE ON GENERATOR ENCLOSURE. MOUNT LIGHT FIXTURE 10" ABOVE GRADE. CIRCUIT LIGHT FIXTURE TO SPARE CIRCUIT IN GENERATOR LOAD CENTER.

ENLARGED ELECTRICAL PLAN
SCALE: 1/4" = 1' - 0"

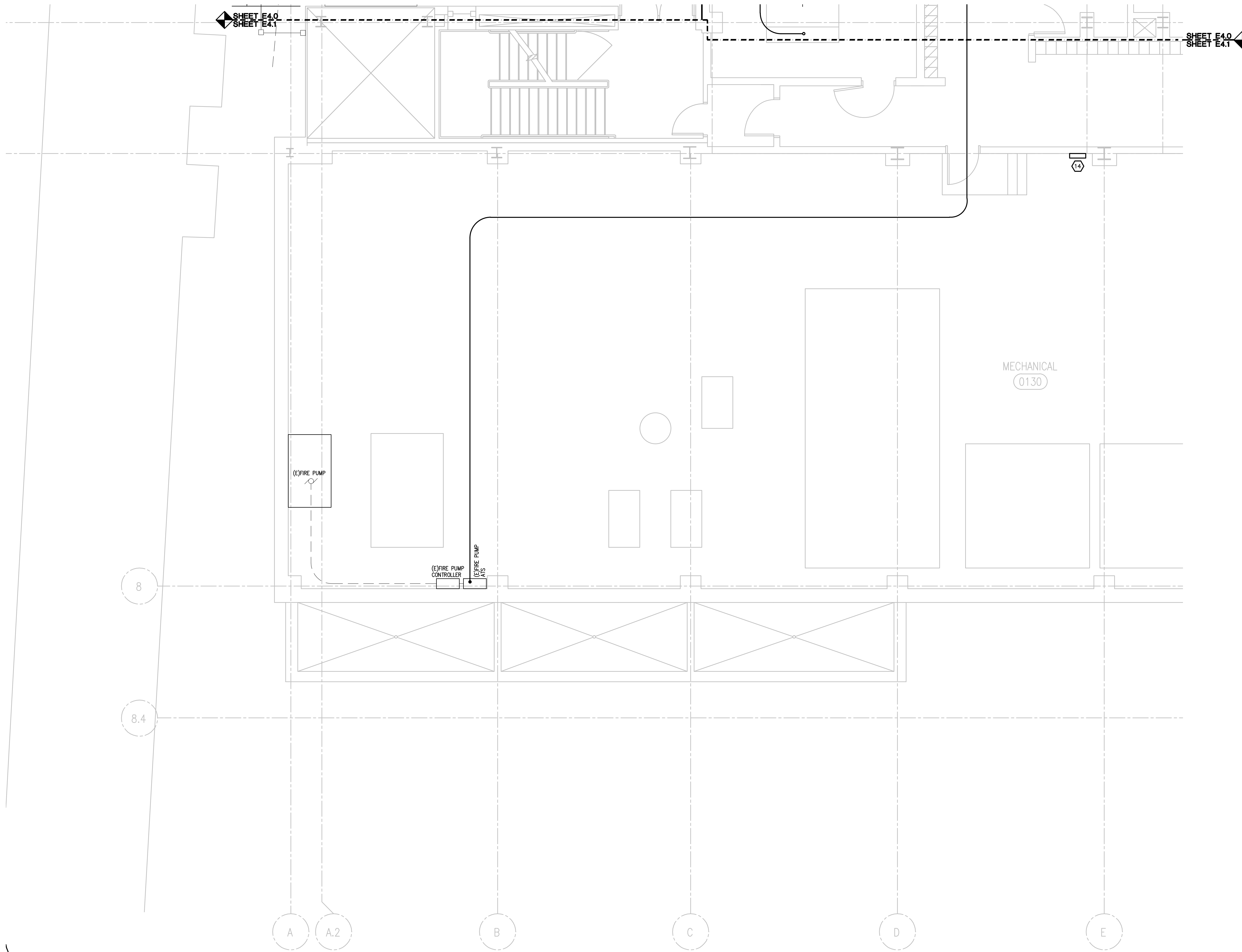
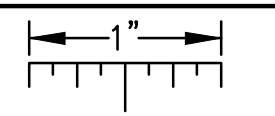


Know what's below.
Call before you dig.

PROJECT TITLE: WSU 603 - COLLEGE OF PHARMACY ELECTRICAL RELIABILITY UPGRADE
 SHEET TITLE: ENLARGED ELECTRICAL PLAN
 DATE: 8/26/2014
 ISSUE: BIDS
 SHEET No.: E4.0
 Peter Basso Associates Inc. CONSULTING ENGINEERS
 5045 Livonia, Suite 100, Livonia, MI 48150
 Tel: 248-679-5996 Fax: 248-679-6007
 www.PeterBassoAssociates.com PBA Project No.: 2010050700
 Detroit, MI 48202

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THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



GENERAL NOTES:

1. THESE NOTES ARE GENERIC GUIDELINES ONLY. ELECTRICAL CONTRACTOR'S PERSONNEL ON SITE SHALL BE THOROUGHLY FAMILIAR WITH THE PUBLISHED SPECIFICATIONS FOR EXACT DESCRIPTIONS OF SCOPE, METHODS, AND MATERIAL.
2. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS, BUT ARE NOT TO BE CONSIDERED FABRICATION DRAWINGS. COORDINATE WITH OTHER TRADES, AND PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS, AND OFFSETS.
3. CONDUCT A SURVEY TO IDENTIFY ALL UNDERGROUND UTILITIES. CALL 811 PRIOR TO EXCAVATION.
4. UTILITIES SHOWN ON THESE DRAWINGS ARE FOR REFERENCE ONLY. COORDINATE EXACT LOCATION OF ALL EXISTING UTILITIES AND ROUTING OF ALL NEW UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
5. DEWATER TRENCHES PRIOR TO INSTALLATION OF CONDUITS. PROVIDE WATER TIGHT FITTINGS ON ALL UNDERGROUND CONDUITS.
6. COORDINATE DEMOLITION WORK, AND ELECTRICAL AND TELEPHONE SERVICES TO THE SITE, WITH THE RESPECTIVE LOCAL UTILITY COMPANY REPRESENTATIVES PRIOR TO COMMENCEMENT OF WORK. INCLUDE ALL ASSOCIATED COSTS/FEES BY THE UTILITY COMPANIES IN THE BID PRICE.
7. INSTALL UNDERGROUND CONDUITS 42" BELOW FINISHED GRADE, MINIMUM, UNLESS NOTED OTHERWISE.
8. COORDINATE SERVICE SHUT-DOWNS WITH ALL TRADES INVOLVED ON SITE AND OBTAIN WRITTEN AUTHORIZATION FROM OWNER 72 HOURS PRIOR TO ANY ELECTRICAL AND/OR TELEPHONE SHUT-DOWN.
9. REMOVE ALL DE-ENERGIZED CONDUCTORS FROM SITE AT COMPLETION OF THE PROJECT.
10. OUTDOOR LIGHTING BRANCH CIRCUIT WIRING SHALL BE MINIMUM #8 AWG CONDUCTORS (XHHW), IN MINIMUM 1" DIA. CONDUIT, UNLESS NOTED OTHERWISE.
11. SPARE CONDUITS SHALL INCLUDE PULL STRING AND SHALL BE TERMINATED WITH A CAP.
12. EXCAVATE THE ENTIRE LENGTH OF TRENCH TO PROPERLY SET DUCT ELEVATIONS.

CONSTRUCTION KEY NOTES:

1. PROVIDE 3/4" FROM ATIS TO REMOTE ATIS ANNUNCIATOR PANEL LOCATED IN THE PENTHOUSE. REFER TO SHEET E2.6 FOR REMOTE ATIS ANNUNCIATOR PANEL LOCATION.
2. PROVIDE 3/4" FROM GEN-1 TO REMOTE GEN-1 ANNUNCIATOR PANEL LOCATED IN THE PENTHOUSE. REFER TO SHEET E2.6 FOR REMOTE GEN-1 ANNUNCIATOR PANEL LOCATION.
3. PROPOSED ROUTING OF (E)FIRE PUMP FEEDER. COORDINATE ROUTING WITH EXISTING FIELD CONDITIONS. TYPICAL CORRIDOR CEILING ARE LAY-IN TYPE. REMOVE AND REPLACE CEILING TILES AS REQUIRED TO INSTALL CONDUIT. REPLACE DAMAGED CEILING TILES.
4. CUSTOM GALVANIZED STEEL STAIRS AND SERVICE PLATFORM. COORDINATE WITH GENERATOR MANUFACTURE.
5. JUNCTION BOX FOR 120V CIRCUIT FOR STRIP HEATER. CIRCUIT TO SPARE BREAKER IN GEN-1 LOAD CENTER.
6. JUNCTION BOX FOR 120V CIRCUIT FOR MEDIUM VOLTAGE CIRCUIT BREAKER CONTROL. CIRCUIT TO SPARE BREAKER IN GEN-1 LOAD CENTER.
7. PROVIDE GROUND PENETRATING RADAR TO SURVEY EXISTING UNDERGROUND UTILITIES IN ENTIRE AREA AFFECTED BY THE PROJECT. HAND DIG NEAR EXISTING UTILITIES.
8. PROVIDE 3/4" FROM GEN-1 TO SIEMENS DIESEL FUEL LEVEL METER LOCATED IN THE PENTHOUSE. REFER TO SHEET E2.6 FOR SIEMENS DIESEL FUEL LEVEL METER LOCATION.
9. NEW LIGHT POLE AND POLE MOUNTED SITE LIGHTING FIXTURE. SEE DETAIL ON SHEET E7.1 FOR POLE BASE REQUIREMENTS. FIXTURE TO BE CONTROLLED VIA INTEGRAL PHOTOCELL. PROVIDE CIRCUIT FROM GEN-1 LOAD CENTER.
10. PROVIDE A NEW 100A 3P 208V CIRCUIT BREAKER IN AVAILABLE SPACE OF EXISTING DP-C FOR NEW GEN-1 LOAD CENTER.
11. CAMERA JUNCTION BOX AT TOP OF NEW LIGHT POLE. CAMERA PROVIDED BY OWNER. PROVIDE 3/4" CONDUIT AND CAT6a WIRING FROM JUNCTION BOX TO EXISTING CABLE TRAY LOCATED IN THE BASEMENT CORRIDOR ABOVE THE CEILING. CAT6a WIRING TO CONTINUE IN EXISTING CABLE TRAY TO COMM ROOM 0462. REFER TO SHEET E2.0 FOR COMM ROOM 0462 LOCATION. ADJUST CAMERA IN FIELD AS REQUIRED.
12. PROVIDE CORING OF EXTERIOR PRECAST WALL AS REQUIRED. PROVIDE SEAL TIGHT AND SEAL SPRAY.
13. DIESEL GENERATOR LOADING/UNLOADING LOCKABLE REMOTE FILL STATION. REFER TO DETAIL ON SHEET E7.1.
14. NEW BMS CONTROL PANEL. EQUIPMENT, POWER WIRING AND CONTROL WIRING PROVIDED BY OTHERS.
15. (1)CAT6a IN 1" TO EXISTING CABLE TRAY IN BASEMENT CORRIDOR ABOVE THE CEILING. CAT6a WIRING TO CONTINUE IN EXISTING CABLE TRAY TO COMM ROOM 0462. REFER TO SHEET E2.0 FOR COMM ROOM 0462 LOCATION.
16. INSTALL "L1" LIGHT FIXTURE ON GENERATOR ENCLOSURE. MOUNT LIGHT FIXTURE 10' ABOVE GRADE. CIRCUIT LIGHT FIXTURE TO SPARE CIRCUIT IN GENERATOR LOAD CENTER.

REVISION

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 PBA Project No.: 2014030700



PROJECT TITLE
 WSU 603 - COLLEGE OF PHARMACY
 ELECTRICAL RELIABILITY
 UPGRADE
 WSU Project No.: 603-243264
 Detroit, MI 48202

WAYNE STATE UNIVERSITY

SHEET TITLE
 ENLARGED ELECTRICAL PLAN

DATE
 8/26/2014

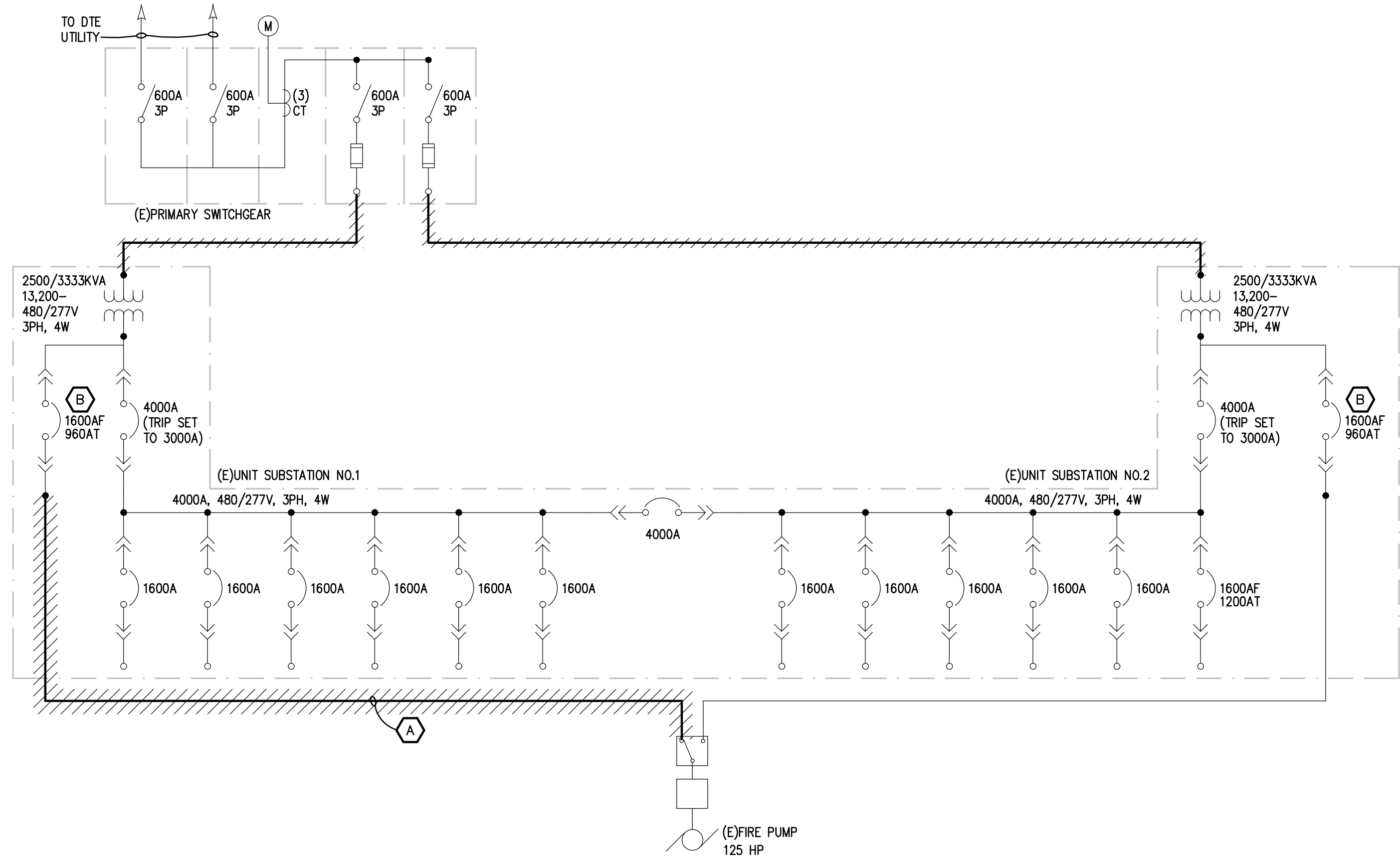
ISSUE
 BIDS

SHEET No.

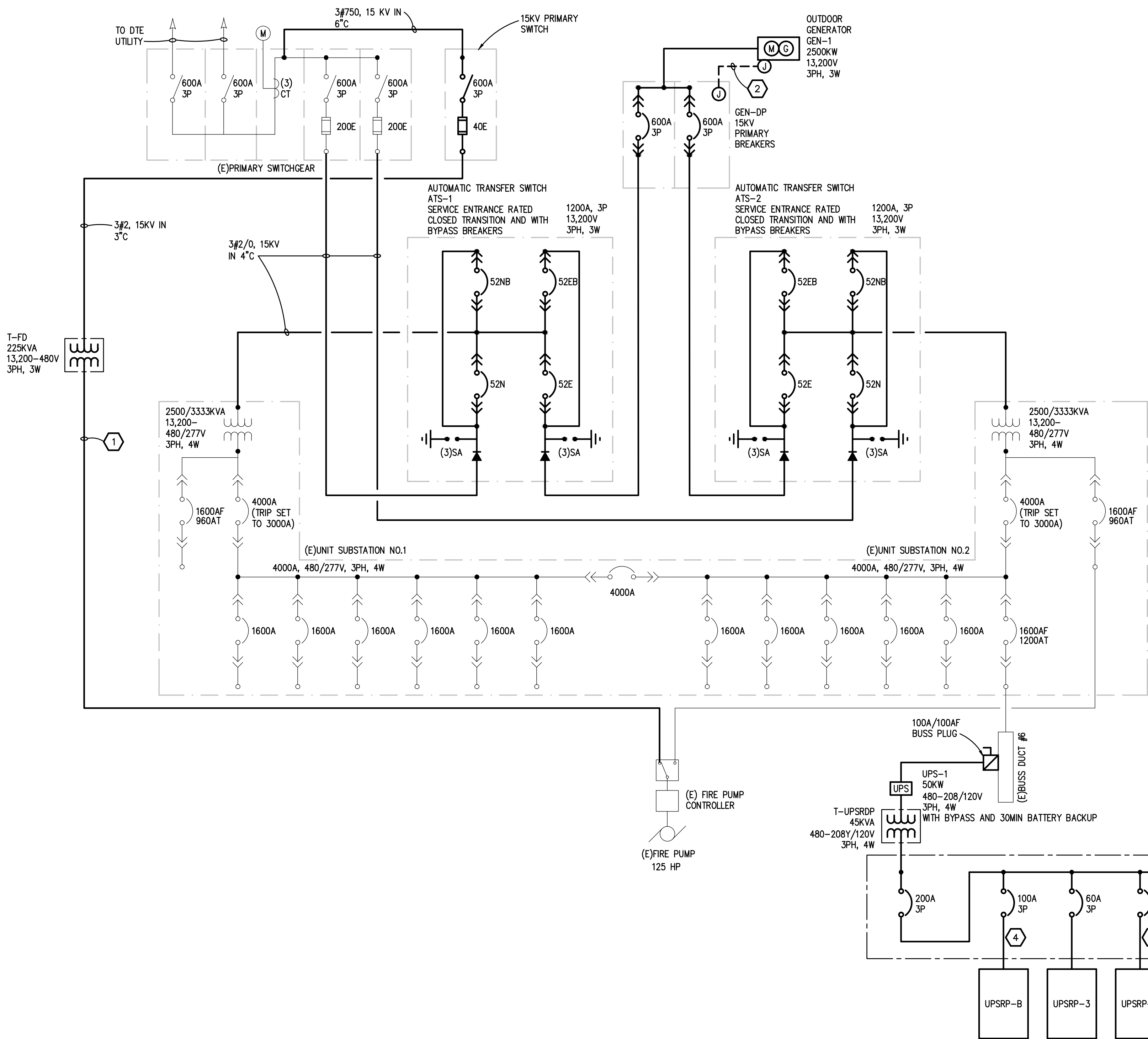
E4.1

ENLARGED ELECTRICAL PLAN
 SCALE: 1/4" = 1' - 0"

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PARTIAL ONE LINE DRAWING - DEMOLITION
NO SCALE



PARTIAL ONE LINE DRAWING - NEW WORK
NO SCALE

GENERATOR SEQUENCE OF OPERATION

EXISTING ELECTRICAL PRIMARY SWITCHGEAR AND UNIT SUBSTATIONS:
 1. THE EXISTING ELECTRICAL PRIMARY SWITCHGEAR CONSISTS OF TWO INCOMING DTE PRIMARY LINES INTO TWO SEPARATE PRIMARY SWITCHES, DTE CT CABINET AND TWO LOAD INTERRUPTER SWITCHES. ONE LOAD INTERRUPTER SWITCH PROVIDED POWER TO SIDE A OF THE UNIT SUBSTATION AND THE SECOND LOAD INTERRUPTER SWITCH PROVIDES POWER TO SIDE B.
 2. THE UNIT SUBSTATION CONSISTS OF A DOUBLE ENDED UNIT SUBSTATION WITH A MAIN-TIE-MAIN. THE MAIN-TIE-MAIN BREAKERS ARE MANUAL.

GENERATOR SEQUENCE:
 1. UPON LOSS OF POWER FROM BOTH DTE PRIMARY LINES THE TWO ATS UNITS WILL SIGNAL THE GENERATOR TO START AFTER A 60 SECOND DELAY.
 2. UPON GENERATOR START THE TWO ATS UNITS WILL TRANSFER TO THE GENERATOR SOURCE AND PROVIDE POWER TO THE UNIT SUBSTATION.
 3. ONCE DTE POWER IS RESTORED AND THE ATS UNITS SENSE STABLE POWER FOR 60 SECONDS THE ATS UNITS WILL TRANSFER THE UTILITY SOURCE AND THE GENERATOR WILL START THE LOCK DOWN SEQUENCE.

PROPOSED CONSTRUCTION SEQUENCE

GENERAL:
 1. PROPOSED CONSTRUCTION SEQUENCE IS PROVIDED FOR BIDDING PURPOSES ONLY. PROVIDE DETAILED CONSTRUCTION SEQUENCE INCLUDING DATES AND DURATION OF WORK TO ENGINEER AND OWNER PRIOR TO COMMENCING WORK.
 2. CONTACT OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF WORK TO COORDINATE POWER SHUTDOWNS. INCLUDE IN BID PRICE LABOR REQUIRED TO PERFORM SHUTDOWN FOR CONNECTION OF NEW FEEDERS FROM EXISTING DTE TRANSFORMERS TO NEW ATS-1 AT DAY AND TIMES DETERMINED BY OWNER. INCLUDE IN BID PRICE LABOR AND MATERIAL REQUIRED FOR POWER SHUTDOWNS DURING WEEKEND OR HOLIDAY. WEEKEND IS DEFINED AS BETWEEN 6PM ON FRIDAY TO 6AM ON THE FOLLOWING MONDAY. INCLUDE IN BID PRICE COST FOR RENTAL, FUEL TEMPORARY CABLES, PLYWOOD TO PROTECT TEMPORARY CABLES, CABLE HOOKUP, ETC FOR TEMPORARY MOBILE DIESEL GENERATOR TO PROVIDE POWER SERVICE TO THE BUILDING DURING POWER SHUTDOWNS. MINIMUM TEMPORARY MOBILE DIESEL GENERATOR SIZE SHALL BE 1000KW UNIT. PROVIDE PLYWOOD ENCLOSURE FOR SECURING CABLES FROM THEFT BETWEEN MOBL GENERATOR AND BUILDING.

PROPOSED SEQUENCE:
 1. INSTALL NEW EXTERIOR GENERATOR, EXTERIOR GENERATOR DISTRIBUTION PANEL, EXTERIOR AUTOMATIC TRANSFER SWITCHES AND GROUND MAT ALONG WITH ALL ASSOCIATED CONDUIT AND FEEDERS.
 2. INSTALL NEW 15KV PRIMARY SWITCH AND TRANSFORMER ALONG WITH ALL ASSOCIATED CONDUIT AND FEEDERS. RELATED TO THE FIRE PUMP SERVICE. COORDINATE SHUTDOWN OF BOTH PRIMARY SWITCHES WITH OWNER. CONNECT NEW FEEDER FROM NEW 15KV PRIMARY SWITCH TO THE EXISTING PRIMARY SWITCHGEAR BUS ON SECONDARY SIDE OF CTS.
 3. TRANSFER LOAD FROM SUBSTATION SIDE A TO SIDE B BY OPENING THE MAIN BREAKER IN SUBSTATION SIDE A AND CLOSING THE TIE BREAKER. REVERSE LOAD TRANSFER ONCE WORK RELATED TO LOAD INTERRUPTER NO.1 IS COMPLETED. COORDINATE SHUTDOWN OF EXISTING LOAD INTERRUPTER NO.1 OF EXISTING UNIT SUBSTATION NO.1 WITH OWNER. CONNECT NEW FEEDER FROM ATS-1 TO EXISTING LOAD INTERRUPTER NO.1. CONNECT NEW FEED FROM ATS-1 TO EXISTING UNIT SUBSTATION NO.1.
 4. TRANSFER LOAD FROM SUBSTATION SIDE B TO SIDE A BY OPENING THE MAIN BREAKER IN SUBSTATION SIDE B AND CLOSING THE TIE BREAKER. REVERSE LOAD TRANSFER ONCE WORK RELATED TO LOAD INTERRUPTER NO.2 IS COMPLETED. COORDINATE SHUTDOWN OF EXISTING LOAD INTERRUPTER NO.2 OF EXISTING UNIT SUBSTATION NO.2 WITH OWNER. CONNECT NEW FEEDER FROM ATS-2 TO EXISTING LOAD INTERRUPTER NO.2. CONNECT NEW FEED FROM ATS-2 TO EXISTING UNIT SUBSTATION NO.2.

LOAD CALCULATION

NOTE: ADDED UPS LOAD IS RELOCATED LOADS. THESE LOADS ARE ALREADY PRESENT IN MEASURED BUILDING LOAD.

MEASURED BUILDING LOAD:	1865.00	kVA
REMOVED LOAD:	- 26.87	kVA
ADDED LOAD:	+ 26.87	kVA
TOTAL LOAD:	1865.00	kVA

Room	Equipment	Voltage	Amps	VA	
1	0250	HPLC-LTQ-Orbitrap Elite	208	60	12480
2	3210	AKTA FPLC Academic Edition	120	3	360
3	3210	AKTA FPLC	120	7.5	900
4	3210	AKTA FPLC Prime Plus	120	1	90
5	3250	ITC/DSC	120	12	1440
6	3250	CD AND COMPUTER	120	3	360
7	3250	UV/Vis Spectrometer	240	5	1200
8	3330	GCMS instrument	120	3	360
9	3437	Micro pump - Ultimate 3000	120	5	600
10	3437	Auto-Sampler - Ultimate 3000 Analytical Split loop	120	5	1100
11	3437	Coulochem III Electrochemical Detector	120	3	360
12	3437	GPC Mix	120	3	360
13	3437	DSC Q2000	120	3	360
14	3437	Freeze Dryer/lyophilizer	120	4	480
15	3520	Real Time PCR System	120	3	360
16	4320	LCMS-Liquid Chromatography Mass Spectroscopy	240	5	1200
17	4440	Real Time PCR System	120	3	360
18	5320	Freeze Dryer/lyophilizer	120	4	480
19	5320	HPLC - High Purity Liquid Chromatography	208	9.5	1976
20	5341	Ver Test 808	120	5	600
21	5341	IDEXX LaserCyte	120	3	360
22	5341	IDEXX Catalyst Dx	120	3	360
23	5341	Heska CBC Diff (Veterinary Hematology System)	120	3	360
24	5341	Heska DRI-Chem 4000	120	3	360

Grand Total: 26.866 kVA

UPS LOAD CALCULATION

GENERAL NOTES:

- THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS, BUT ARE NOT TO BE CONSIDERED FABRICATION DRAWINGS. COORDINATE WITH OTHER TRADES, AND PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS, AND OFFSETS.
- FEEDER AND BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE "FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE-GENERAL PURPOSE" ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
- TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE "TRANSFORMER CIRCUIT SIZING SCHEDULE-GENERAL PURPOSE" ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
- MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH THE MOTOR CIRCUIT SIZING SCHEDULES ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
- BASIS OF DESIGN IS CATERPILLAR POWER GENERATION EQUIPMENT SQUARE D DISTRIBUTION EQUIPMENT AND ASCO TRANSFER SWITCHES. IF THE CONTRACTOR ELECTS TO PROVIDE EQUIPMENT FROM OTHER APPROVED MANUFACTURERS, THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE THE LAYOUT AND CLEARANCE REQUIREMENTS IN ALL SPACES CONTAINING ELECTRICAL EQUIPMENT AND PROVIDE EQUIPMENT MEETING THE SPECIFICATIONS AND ACHIEVING CODE REQUIRED CLEARANCES WITHIN THE SPACE PROVIDED.
- BRANCH CIRCUIT CONDUCTORS, FEEDERS, AND BRANCH CIRCUIT OVERCURRENT PROTECTION ARE SIZED AT 125% OF THE TOTAL CONTINUOUS AND NON CONTINUOUS LOAD FOR LIGHTING AND MOTOR LOADS THAT RUN CONTINUOUSLY FOR THREE HOURS OR MORE (NEC 210.19 A, 210.20 A, AND 215.2 A). DEMAND AND CONNECTED LOADS ARE CALCULATED PER NEC 220.

DEMOLITION NOTES:

- REMOVE EXISTING CABLES FROM SUBSTATION TO FIRE PUMP. EXISTING UNDERGROUND CONDUIT TO REMAIN IN PLACE. PERFORM WORK AFTER FIRE PUMP FEEDER IS SAFE IN PLACE. LABEL EXISTING DRAWOUT BREAKER AS SPARE.
- DRAWOUT BREAKER TO BE TRIPPED AFTER NEW FIRE PUMP FEEDER IS IN PLACE.

CONSTRUCTION KEY NOTES:

- PROVIDE 3#50KCMIL & 1#4/0(4)-3" C TWO HOUR FIRE RESISTIVE CABLE DRAKA LIFELINE OR SIMILAR TO COMPLY WITH NEC ARTICLE 695.6 PART 2.
- PROVIDE 10-#12 & 1 #20 - 1-1/4" FOR CONTROL WIRING BETWEEN GENERATOR OVERCURRENT PROTECTION AND MEDIUM VOLTAGE PRIMARY BREAKERS. COORDINATE REQUIREMENTS WITH GENERATOR MANUFACTURER.
- PROVIDE 3#2, 1#2 N, & 1#6 G IN 1-1/4".
- PROVIDE 3#3/0, 1#3/0 N, & 1#6 G IN 2".

REVISION

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 PBA Project No.: 2014050700

Peter Basso Associates Inc
 CONSULTING ENGINEERS

PROJECT TITLE
**WSU 603 - COLLEGE OF PHARMACY
 ELECTRICAL RELIABILITY
 UPGRADE**

PROJECT NO.: 603-243264
 DETROIT, MI 48202

**WAYNE STATE
 UNIVERSITY**

SHEET TITLE
ONE LINE DIAGRAM

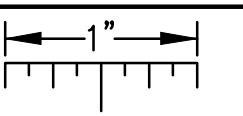
DATE
 8/26/2014

ISSUE
 BIDS

SHEET No.

E5.1

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	BA	BB	BC	VA	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R				4160	4160				20	SPARE	R	2
3	R	HPCL-L10-orbitrap elite	NEW	60	4160	4160	4160			20	SPARE	R	4
5	R				4160					20	SPARE	R	6
7	R									20	SPARE	R	8
9	R									20	SPARE	R	10
11	R									20	SPARE	R	12
13	R									20	SPARE	R	14
15	R									20	SPARE	R	16
17	R									20	SPARE	R	18
19	R									20	SPARE	R	20
					4160	4160	4160						
					BA	BB	BC						

PANELBOARD INFORMATION	BRANCH CIRCUIT CONNECTED LOAD:	FEEDER DEMAND LOAD:	OVERCURRENT LOAD:	NOTES:
VOLTAGE: 208Y/120	CONTINUOUS LOAD (C):	X 125%	X 100%	
BUS AMPACITY: 100A	NON-CONTINUOUS LOAD (NC):	X 100%	X 100%	
MAIN TYPE: 60A MCB	KITCHEN LOAD (K):	X 100%	X 100%	
MINIMUM A.I.C.: 10,000	RECEPTACLE BASE LOAD (R):	X 100%	X 100%	10000
MOUNTING: SURFACE	RECEPTACLE DEMAND LOAD (RD):	X 50%	X 100%	1240
	LIGHTING LOAD (L):	X 100%	X 125%	
PANELBOARD LOCATION	TRACK LIGHTING (T):	(150VA/2FT)	X 125%	
245	MOTORS, HIGHEST LOAD (M):	X 125%	X 100%	
	MOTORS, REMAINING LOAD (MR):	X 100%	X 100%	
	TOTAL (VA):	12.48	TOTAL (VA):	11.24
	TOTAL (AMP):	34.54	TOTAL (AMP):	31.20

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	BA	BB	BC	VA	CB TYPE	DESCRIPTION	LOAD TYPE	#		
1	R	AKTA PFLC ACADEMIC EDITION	NEW	20	360	960				600	20	NEW	R	2	
3	R	AKTA PFLC	NEW	20	960		1500			600	20	NEW	R	4	
5	R	AKTA PFLC PRIME PLUS	NEW	20	90			450		360	20	NEW	R	6	
7	R	ITC/ISSC	NEW	20	1440	1800				360	20	NEW	R	8	
9	R	CD AND COMPUTER	NEW	20	360			720		360	20	NEW	R	10	
11	R	UV/MS SPECTROMETER	NEW	20	600	960				1080	480	20	NEW	R	12
13	R				600	960				360	20	NEW	R	14	
15	R	LCMS INSTRUMENT	NEW	20	360			360		20	NEW	SPARE	R	16	
17	R	MICRO PUMP - ULTIMATE 3000	NEW	20	600			600		20	NEW	SPARE	R	18	
19	R									20	NEW	SPARE	R	20	
					3720	2580	2130								
					BA	BB	BC								

PANELBOARD INFORMATION	BRANCH CIRCUIT CONNECTED LOAD:	FEEDER DEMAND LOAD:	OVERCURRENT LOAD:	NOTES:
VOLTAGE: 208Y/120	CONTINUOUS LOAD (C):	X 125%	X 100%	
BUS AMPACITY: 60A	NON-CONTINUOUS LOAD (NC):	X 100%	X 100%	
MAIN TYPE: 60A MCB	KITCHEN LOAD (K):	X 100%	X 100%	
MINIMUM A.I.C.: 10,000	RECEPTACLE BASE LOAD (R):	X 100%	X 100%	8430
MOUNTING: SURFACE	RECEPTACLE DEMAND LOAD (RD):	X 50%	X 100%	8430
	LIGHTING LOAD (L):	X 100%	X 125%	
PANELBOARD LOCATION	TRACK LIGHTING (T):	(150VA/2FT)	X 125%	
3421	MOTORS, HIGHEST LOAD (M):	X 125%	X 100%	
	MOTORS, REMAINING LOAD (MR):	X 100%	X 100%	
	TOTAL (VA):	8.43	TOTAL (VA):	8.43
	TOTAL (AMP):	23.40	TOTAL (AMP):	23.40

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	BA	BB	BC	VA	CB TYPE	DESCRIPTION	LOAD TYPE	#	
1	R				600	600				20	NEW	SPARE	R	2
3	R	LCMS-LIQUID CHROMATOGRAPHY MASS SPECTROSCOPY	NEW	20	600	600	600			20	NEW	SPARE	R	4
5	R	REAL TIME PCR SYSTEM	NEW	20	360			360		20	NEW	SPARE	R	6
7	R									20	NEW	SPARE	R	8
9	R									20	NEW	SPARE	R	10
11	R									20	NEW	SPARE	R	12
13	R									20	NEW	SPARE	R	14
15	R									20	NEW	SPARE	R	16
17	R									20	NEW	SPARE	R	18
19	R									20	NEW	SPARE	R	20
					600	600	360							
					BA	BB	BC							

PANELBOARD INFORMATION	BRANCH CIRCUIT CONNECTED LOAD:	FEEDER DEMAND LOAD:	OVERCURRENT LOAD:	NOTES:
VOLTAGE: 208Y/120	CONTINUOUS LOAD (C):	X 125%	X 100%	
BUS AMPACITY: 60A	NON-CONTINUOUS LOAD (NC):	X 100%	X 100%	
MAIN TYPE: 60A MCB	KITCHEN LOAD (K):	X 100%	X 100%	
MINIMUM A.I.C.: 10,000	RECEPTACLE BASE LOAD (R):	X 100%	X 100%	1560
MOUNTING: SURFACE	RECEPTACLE DEMAND LOAD (RD):	X 50%	X 100%	1560
	LIGHTING LOAD (L):	X 100%	X 125%	
PANELBOARD LOCATION	TRACK LIGHTING (T):	(150VA/2FT)	X 125%	
4368	MOTORS, HIGHEST LOAD (M):	X 125%	X 100%	
	MOTORS, REMAINING LOAD (MR):	X 100%	X 100%	
	TOTAL (VA):	1.56	TOTAL (VA):	1.56
	TOTAL (AMP):	4.33	TOTAL (AMP):	4.33

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	BA	BB	BC	VA	CB TYPE	DESCRIPTION	LOAD TYPE	#	
1	R	FREEZE DRYER/LYOPHILIZER	NEW	20	480	480				20	NEW	SPARE	R	2
3	R	1000	NEW	20	1000		1000			20	NEW	SPARE	R	4
5	R	HPCL - HIGH PURITY LIQUID CHROMATOGRAPHY	NEW	20	1000			1000		20	NEW	SPARE	R	6
7	R	NET TEST 80B	NEW	20	600	600				20	NEW	SPARE	R	8
9	R	IBOX LASERCYTE	NEW	20	360			360		20	NEW	SPARE	R	10
11	R	IBOX CATALYST BX	NEW	20	360			360		20	NEW	SPARE	R	12
13	R	HEKA CBC DPT(BETTERINARY HEMATOLOGY SYSTEM)	NEW	20	360			360		20	NEW	SPARE	R	14
15	R	HEKA DW CHEM 4000	NEW	20	360			360		20	NEW	SPARE	R	16
17	R									20	NEW	SPARE	R	18
19	R									20	NEW	SPARE	R	20
					1440	1720	1360							
					BA	BB	BC							

PANELBOARD INFORMATION	BRANCH CIRCUIT CONNECTED LOAD:	FEEDER DEMAND LOAD:	OVERCURRENT LOAD:	NOTES:
VOLTAGE: 208Y/120	CONTINUOUS LOAD (C):	X 125%	X 100%	
BUS AMPACITY: 60A	NON-CONTINUOUS LOAD (NC):	X 100%	X 100%	
MAIN TYPE: 60A MCB	KITCHEN LOAD (K):	X 100%	X 100%	
MINIMUM A.I.C.: 10,000	RECEPTACLE BASE LOAD (R):	X 100%	X 100%	4520
MOUNTING: SURFACE	RECEPTACLE DEMAND LOAD (RD):	X 50%	X 100%	4520
	LIGHTING LOAD (L):	X 100%	X 125%	
PANELBOARD LOCATION	TRACK LIGHTING (T):	(150VA/2FT)	X 125%	
5431	MOTORS, HIGHEST LOAD (M):	X 125%	X 100%	
	MOTORS, REMAINING LOAD (MR):	X 100%	X 100%	
	TOTAL (VA):	4.52	TOTAL (VA):	4.52
	TOTAL (AMP):	12.55	TOTAL (AMP):	12.55

REVISION

REVISION

5045 Livorno, Suite 100
 Detroit, MI 48224
 Tel: 248-679-5996 Fax: 248-679-4707
 www.PeterBassoAssociates.com
 PBA Project No. 2014030701

Peter Basso Associates Inc
 CONSULTING ENGINEERS

PROJECT TITLE
 WSU 603 - COLLEGE OF PHARMACY
 ELECTRICAL RELIABILITY
 UPGRADE
 WSU - Project No.: 603-243264
 Detroit, MI 48202

WAYNE STATE UNIVERSITY

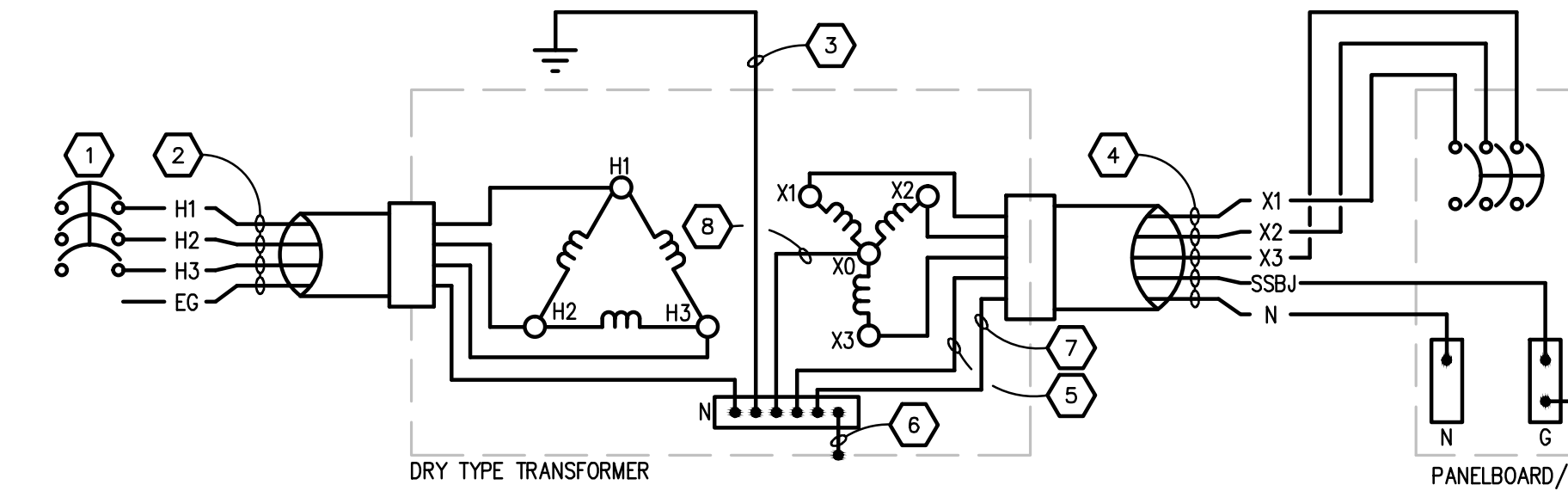
SHEET TITLE
 PANEL SCHEDULES

DATE
 8/26/2014

ISSUE
 BIDS

SHEET No.

E5.2

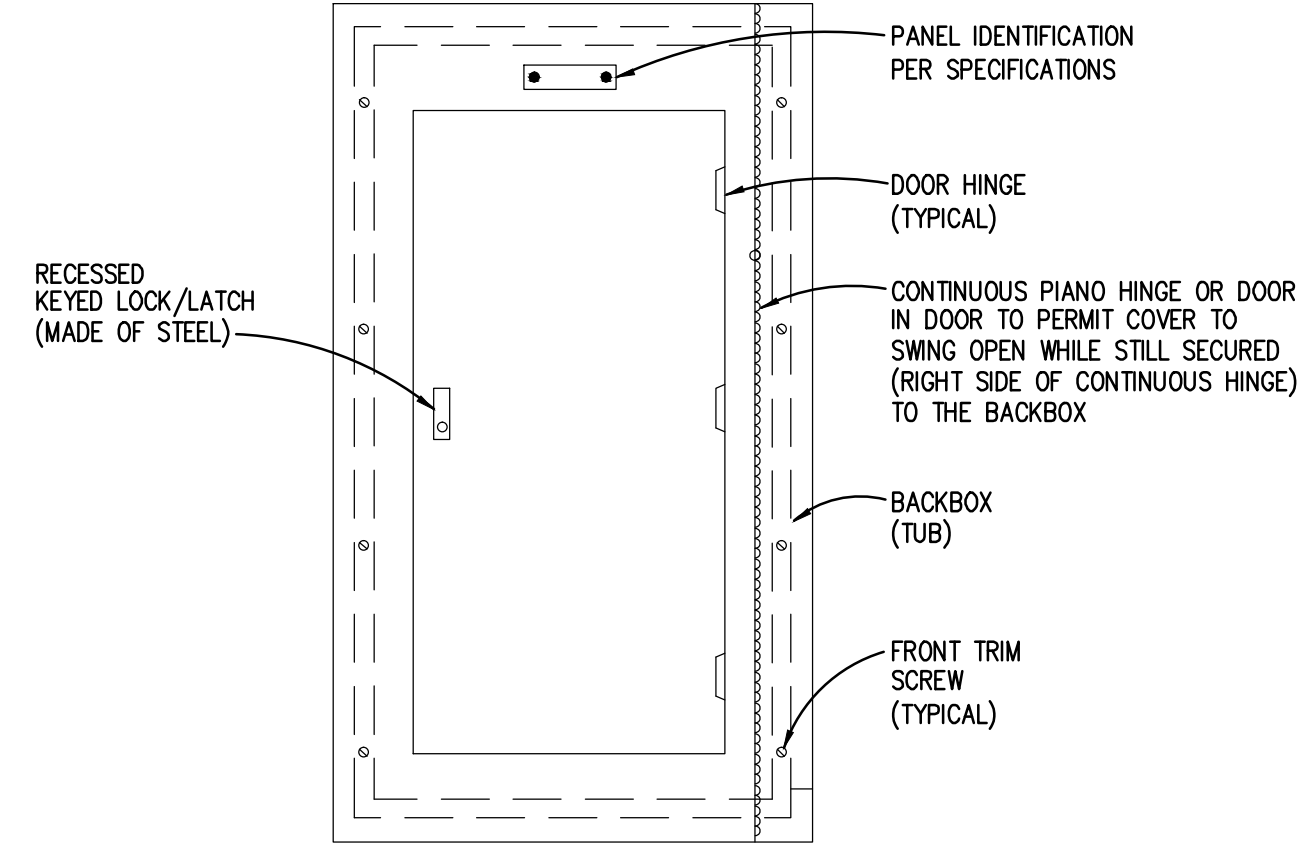


KEYED NOTES:

1. 480V, 3Ø PRIMARY CIRCUIT BREAKER BASED ON DRY TYPE DISTRIBUTION TRANSFORMER CIRCUIT SIZING SCHEDULE ON ELECTRICAL STANDARD SCHEDULE DRAWING UNLESS OTHERWISE NOTED.
2. PRIMARY FEEDER BASED ON FEEDER AND BRANCH CIRCUIT SIZING TABLE ON ELECTRICAL STANDARD SCHEDULE DRAWING UNLESS OTHERWISE NOTED.
3. GROUNDING ELECTRODE CONDUCTOR TO NEAREST GROUNDING ELECTRODE (i.e. BUILDING STEEL, METAL WATER PIPE, GROUND RING, OR GROUND BUS). SEE DRY TYPE DISTRIBUTION TRANSFORMER CIRCUIT SIZING SCHEDULE ON ELECTRICAL STANDARD SCHEDULE DRAWING FOR SIZE UNLESS OTHERWISE NOTED.
4. 208Y/120V, 3Ø, 4W SECONDARY FEEDER BASED ON DRY TYPE DISTRIBUTION TRANSFORMER CIRCUIT SIZING SCHEDULE ON ELECTRICAL STANDARD SCHEDULE DRAWING UNLESS OTHERWISE NOTED.
5. SUPPLY SIDE BONDING JUMPER.
6. SYSTEM BONDING JUMPER.
7. GROUNDING CONDUCTOR (NEUTRAL).
8. NEUTRAL CONDUCTOR PROVIDED WITH EQUIPMENT.

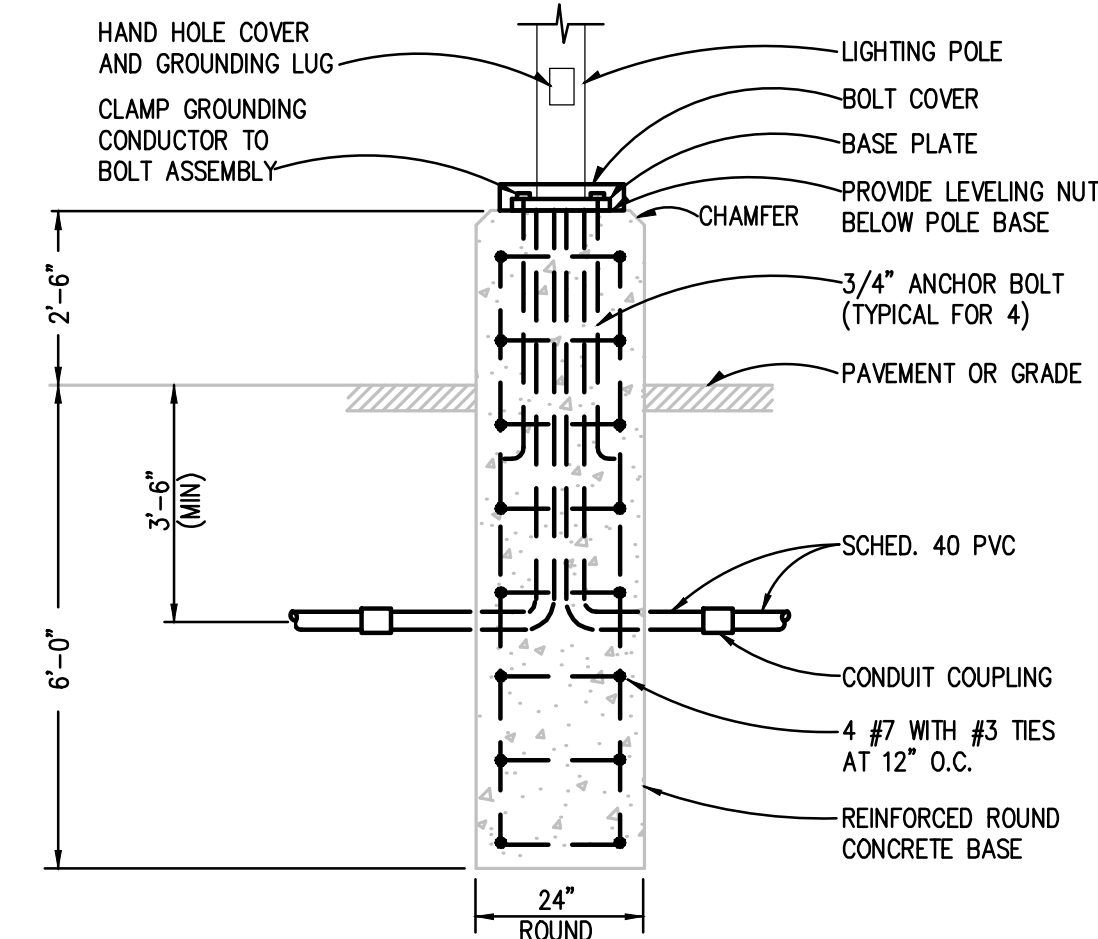
DRY TYPE DISTRIBUTION TRANSFORMER GROUNDING ARRANGEMENT

NO SCALE



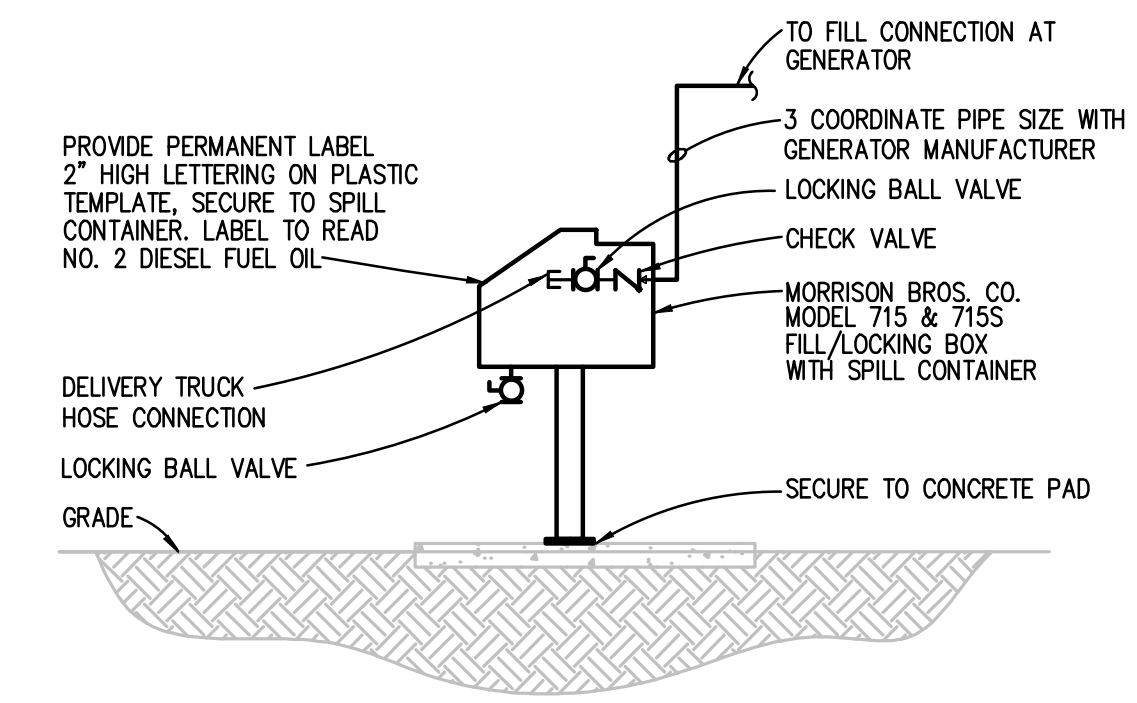
PANELBOARD FRONT COVER DETAIL

NO SCALE



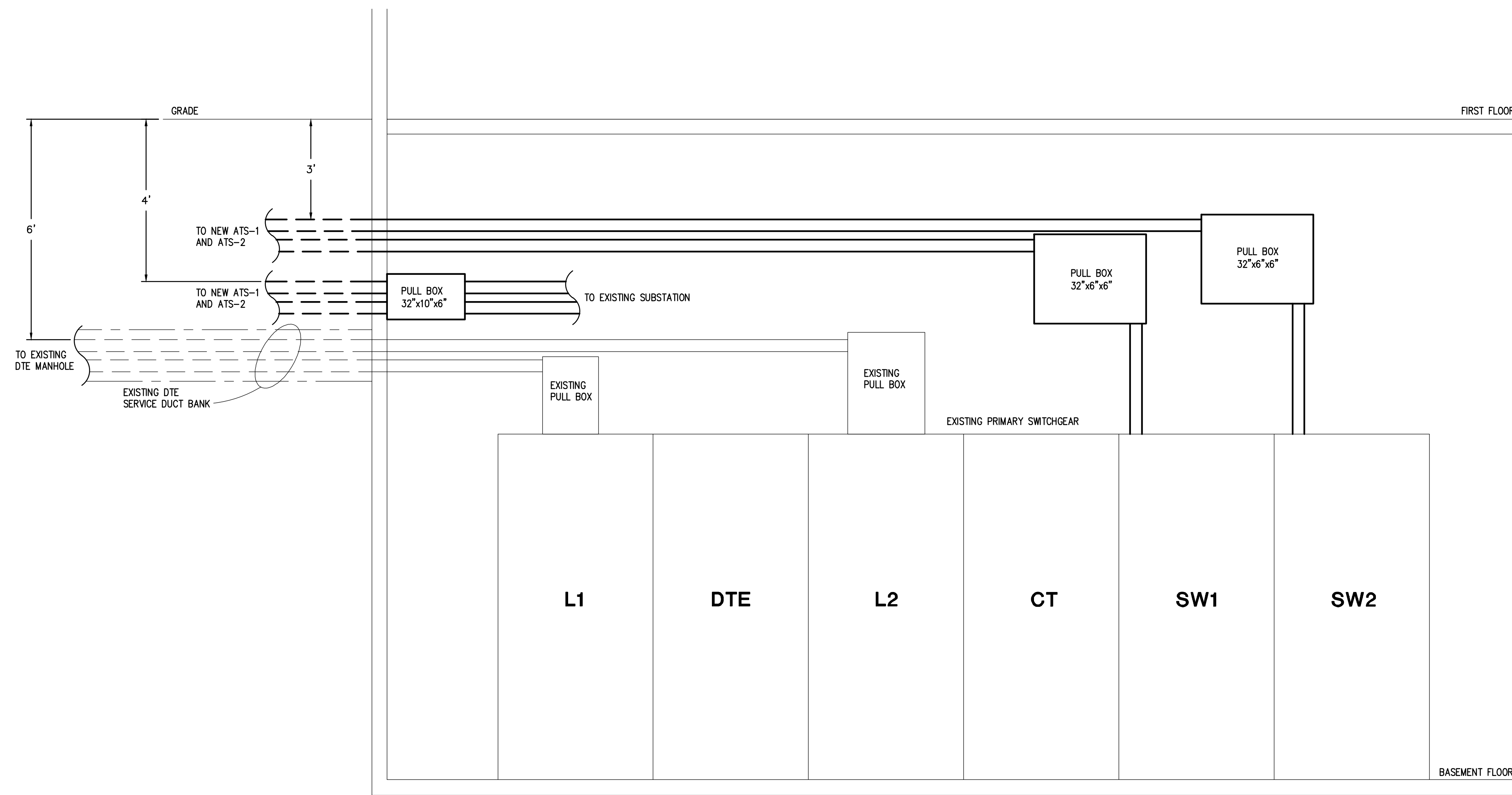
LIGHTING POLE BASE DETAIL

NO SCALE



REMOTE FILL STATION DIAGRAM

NO SCALE



ELECTRICAL 0210 ROOM SECTION

NO SCALE

REVISION

REVISION

5045 Livonia, Suite 100
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Tel: 248-679-5996 Fax: 248-679-6007
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PBA Project No.: 2014050700



PROJECT TITLE
WSU 603 - COLLEGE OF PHARMACY
ELECTRICAL RELIABILITY
UPGRADE
WSU - Project No.: 603-243264
Detroit, MI 48202



SHEET TITLE
ELECTRICAL DETAILS AND
DIAGRAMS

DATE
8/26/2014

ISSUE
BIDS

SHEET No.

E7.1

Anixter Building Automation Cables

Non-Plenum

SBT Part Number	Description	Print Legend
H-TP20-CM	20AWG,STR,1TP,CM,BLUE JACKET	NORTHFLEX ® H-TP20-CM "DI, DO, AI, AO" (Mfg E#) 20AWG 1P 75°C CM (UL) C(UL)
H-3C20-CM	20AWG,STR,3COND,CM,BLUE JACKET	NORTHFLEX ® H-3C20-CM "TEC V/D" (Mfg E#) 20 AWG 3C 75°C CM (UL) C(UL)
H-TP18-CMR	18AWG,STR,1TP,CMR,BLUE JACKET	NORTHFLEX ® H-TP18-CMR "DI, DO, AI, AO" (Mfg E#) 18AWG 1P 75°C CMR (UL) C(UL)
H-3C18-CMR	18AWG,STR,3COND,CMR,BLUE JACKET	NORTHFLEX ® H-3C18-CMR "TEC V/D" (Mfg E#) 18 AWG 3C 75°C CMR (UL) C(UL)
H-2C14-CL3R	14AWG,STR,2COND,CL3R,DARK BLUE JACKET	H-2C14-CL3R "LV POWER" (Mfg E#) 14 AWG 2C 75°C CL3R (UL) C(UL)
H-B-TSP24LC-CM	BLN24AWG,STR,TSP,LOCAP,CM,ORANGE JACKET	H-B-TSP24LC-CM "BLN" (Mfg E#) 24 AWG 1P 75°C CM (UL) C(UL)
H-F-TSP24LC-CM	FLN24AWG,STR,TSP,LOCAP,CM,ORANGE JACKET W/ BLUE STRIPE	NORTHFLEX ® H-F-TSP24LC-CM "FLN" (Mfg E#) 24 AWG 1P 75°C CM (UL) C(UL)
H-3P24-CMR	24AWG,SOL,3P,CMR,BLUE JACKET	NORTHFLEX ® H-3P24-CMR "TEC STAT" (Mfg E#) 24 AWG 3P 75°C CMR (UL) C(UL)
LON-1P22-CM	22AWG,STR,1PAIR,CM,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-1P22-CM "LON FLN" (Mfg E#) 22AWG 1P 750 C CM (UL) C(UL)
LON-2P22-CM	22AWG,STR,2PAIR,CM,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-2P22-CM "LON FLN" (Mfg E#) 22AWG 2P 750 C CM (UL) C(UL)
LON-1PS22-CM	22AWG,STR,1PAIR,OAS,CM,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-1PS22-CM "LON FLN" (Mfg E#) 22AWG 1P 750 C CM (UL) C(UL)
LON-2PS22-CM	22AWG,STR,2PAIR,OAS,CM,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-2PS22-CM "LON FLN" (Mfg E#) 22AWG 2P 750 C CM (UL) C(UL)
E-4TP24CAT5-CM	24AWG,SOL,4TP,CAT5,CM	NORTHFLEX ® E-4TP24CAT5-CM "ETHERNET" (Mfg E#) 24AWG 4P 750 C CM (UL) C(UL)
H-A-1.5TSP24LC-CM	ALN485, 24AWG, STR, TP+1C, OAS, LOCAP, CM	NORTHFLEX ® H-A-1.5TSP24LC-CM "ALN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#)
H-F-1.5TSP24LC-CM	FLN485, 24AWG, STR, TP+1C, OAS, LOCAP, CM	NORTHFLEX ® H-A-1.5TSP24LC-CM "FLN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#)

Plenum

SBT Part Number	Description	Print Legend
H-TP20-CMP	20AWG,STR,1TP,CMP,BLUE JACKET	NORTHFLEX ® H-TP20-CMP "DI, DO, AI, AO" (Mfg E#) 20 AWG 2C 75°C CMP (UL) C(UL)
H-3C20-CMP	20AWG,STR,3COND,CMP,BLUE JACKET	NORTHFLEX ® H-3C20-CMP "TEC V/D" (Mfg E#) 20 AWG 3C 75°C CMP (UL) C(UL)
H-TP18-CMP	18AWG,STR,1TP,CMP,BLUE JACKET	NORTHFLEX ® H-TP18-CMP "DI, DO, AI, AO" (Mfg E#) 18 AWG 2C 75°C CMP (UL) C(UL)
H-3C18-CMP	18AWG,STR,3COND,CMP,BLUE JACKET	NORTHFLEX ® H-3C18-CMP "TEC V/D" (Mfg E#) 18 AWG 3C 75°C CMP (UL) C(UL)
H-2C14-CL3P	14AWG,STR,2COND,CL3P,DARK BLUE JACKET	NORTHFLEX ® H-2C14-CL3P "LV POWER" (Mfg E#) 14 AWG 2C 75°C CL3P (UL) C(UL)
H-B-TSP24LC-CMP	BLN24AWG,STR,TSP,LOCAP,CMP,ORANGE JACKET	NORTHFLEX ® H-B-TSP24LC-CMP "BLN" (Mfg E#) 24 AWG TSP 75°C CMP (UL) C(UL)
H-F-TSP24LC-CMP	FLN24AWG,STR,TSP,LOCAP,CMP,ORANGE JACKET W/ BLUE STRIPE	NORTHFLEX ® H-F-TSP24LC-CMP "FLN" (Mfg E#) 24 AWG TSP 75°C CMP (UL) C(UL)
H-3P24-CMP	24AWG,SOL,3PAIR,CMP,BLUE JACKET	NORTHFLEX ® H-3P24-CMP "TEC STAT" (Mfg E#) 24 AWG 3P 75°C CMP (UL) C(UL)
LON-1P22-CMP	22AWG,STR,1PAIR,CMP,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-1P22-CMP "LON FLN" (Mfg E#) 22AWG 1P 750 C CMP (UL) C(UL)
LON-2P22-CMP	22AWG,STR,2PAIR,CMP,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-2P22-CMP "LON FLN" (Mfg E#) 22AWG 2P 750 C CMP (UL) C(UL)
LON-1PS22-CMP	22AWG,STR,1PAIR,OAS,CMP,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-1PS22-CMP "LON FLN" (Mfg E#) 22AWG 1P 750 C CMP (UL) C(UL)
LON-2PS22-CMP	22AWG,STR,2PAIR,OAS,CMP,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-2PS22-CMP "LON FLN" (Mfg E#) 22AWG 2P 750 C CMP (UL) C(UL)
E-4TP24CAT5-CMP	24AWG,SOL,4TP,CAT5,CMP	NORTHFLEX ® E-4TP24CAT5-CMP "ETHERNET" (Mfg E#) 24AWG 4P 750 C CMP (UL)
H-A-1.5TSP24LC-CMP	ALN485, 24AWG, STR, TP+1C, OAS, LOCAP, CMP	NORTHFLEX ® H-A-1.5TSP24LC-CM "ALN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#)
H-F-1.5TSP24LC-CMP	FLN485, 24AWG, STR, TP+1C, OAS, LOCAP, CMP	NORTHFLEX ® H-A-1.5TSP24LC-CM "FLN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#)

Assemblies

SBT Part Number	Description	Print Legend
550-827	CABLE ASSEMBLY TEC TO SSB 3 POS 10 FT	N/A
550-828	CABLE ASSEMBLY TEC TO SSC 3 POS 10 FT	N/A

REVISION HISTORY

SIEMENS

Siemens Industry, Inc.
Building Technologies Division

45470 Commerce Ctr. Dr.
Plymouth Twp., MI 48170
USA
PHONE: 734.456.3800
FAX: 866.815.0749

WSU College of Pharm Generator
Detroit, MI

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
SFM	TAJ		08/07/14	08/26/14

Anixter Building Auto. Cables

0
ABAC

900 – ELECTRICAL INSTALLATION AND WIRING FOR HVAC TEMPERATURE AND LAB CONTROLS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Division 23, Common Work Results for mechanical requirements apply to this section and will require the contractor participation on the Above Ceiling Coordination Program.

1.2 GENERAL INFORMATION

- A. This specification section shall include all electrical responsibilities required for the installation & wiring of all temperature controls, as outlined on job plans, specification and temperature control drawings. Specifically, this contractor shall provide pricing direct to those general or mechanical contractors (bid to prime on project) contractors bidding this work, and will be responsibilities for installation & wiring of all automatic temperature control devices furnished by Siemens Building Technologies as outlined below and as may be required per the project plans & specifications.

- B. Siemens Building Technologies, Inc. will provide the following equipment for the building automation system as shown in the temperature control drawings Bill of Materials to include but not limited to:

1. Terminal Equipment Controllers (TEC's)
2. Auxilliary TEC power panels
3. Room Temperature Sensors
4. Damper actuators
5. Relays
6. Low Voltage Transformers

The Electrical Installation & Wiring Contractor (EIWC) shall be responsible for installation of all preceding devices as applicable to this project. This list shall not be considered complete and all bidders should refer to temperature control drawings for specific equipment quantities and locations.

- C. During the bidding process, the EIWC shall address all questions relative to the Siemens temperature control drawings in writing (RFI) through the tier of bidding contractors. Siemens shall respond in writing through the tier of bidding contractors.
- D. EIWC shall install all control equipment provided by Siemens. The EIWC shall furnish, install, and terminate all necessary wiring, conduit, hangers, etc. to provide a complete control system installation. All controls to be installed and adjusted by a Siemens qualified electrician in the full time employ of the EIWC.

- E. The EIWC must have full time project superintendent who shall attend all construction meetings after notification that their services are required onsite.
- F. Upon completion of all installation and wiring by the EIWC, Siemens Building Technologies will conduct verification of point to point wiring and any pneumatic tubing. The EIWC will be responsible to make any necessary wiring corrections. At the completion of the point to point verification, approval shall be made by the Owner's Construction Inspection Department and Siemens Building Technologies, Inc.
- G. Upon approval by the Owners Construction Inspection Department, Siemens shall program all DDC panels, create necessary graphics and provide any interface between the building automation system and the campus environmental control system.
- H. Upon completion of the aforementioned, a performance test shall be conducted as specified in the commissioning section of the specifications.
- I. Upon a successful conclusion of the final checkout, performance test and the Owner's acceptance, the EIWC's responsibility reverts to a standard warranty (12 months) for labor and material installed by the EIWC and labor only for equipment supplied by others.
- J. Siemens assumes the manufacturers warranty for all equipment supplied to the EIWC for installation on this project.
- K. Siemens services to include the following: Design engineering labor required to interface with WSU and the consulting engineer to design the temperature control system. Supervision of the EIWC installation and final checkout and approval.
- L. Equipment provided by others may require specific cable type and terminations. It is up to EIWC to provide cable and terminations needed for a complete working system.

1.3 DEFINITIONS

- A. DDC: Direct digital control.
- B. I/O: Input/output.
- C. BACnet: A control network technology platform for designing and implementing interoperable control devices and networks.
- D. MS/TP: Master slave/token passing.
- E. PC: Personal computer.
- F. PID: Proportional plus integral plus derivative.
- G. RTD: Resistance temperature detector.

REVISION HISTORY	SIEMENS	45470 Commerce Ctr. Dr. Plymouth Twp., MI 48170 USA PHONE: 734.456.3800 FAX: 866.815.0749	WSU College of Pharm Generator Detroit, MI				0 SPEC1					
			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="font-size: 8px;">ENGINEER</th> <th style="font-size: 8px;">DRAFTER</th> <th style="font-size: 8px;">CHECKED BY</th> <th style="font-size: 8px;">INITIAL RELEASE</th> <th style="font-size: 8px;">LAST EDIT DATE</th> </tr> <tr> <td style="text-align: center;">SFM</td> <td style="text-align: center;">TAJ</td> <td></td> <td style="text-align: center;">08/07/14</td> <td style="text-align: center;">08/28/14</td> </tr> </table>	ENGINEER	DRAFTER	CHECKED BY		INITIAL RELEASE	LAST EDIT DATE	SFM	TAJ	
ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE								
SFM	TAJ		08/07/14	08/28/14								

Wayne State University

Wayne State University

1.4 PRODUCTS & SERVICES PROVIDED BY OTHERS

- A. Mechanical Contractor: Installation of flow switches, temperature or thermometer sensor wells, gage taps, pressure sensor pipe taps, final valves & tubing into pipe pressure taps and variable frequency drives.
- B. Electrical Contractor: Provide 120/60 VAC power to all DDC panels, wire power to all VFD's. Furnish & install 4" x 4" trough above all control panels. Furnish & install conduit up maximum ten feet from all 4" x 4" troughs. Installation all required nipples between electrical panels and through.
- C. Sheetmetal Contractor: Installing all terminal units, airflow stations and dampers.

1.5 PRODUCTS INSTALLED BY THE EIWC BUT NOT FURNISHED UNDER THIS SECTION

- A. Connect control components, as shown on the plans, factory supplied as part of equipment controlled.

1.6 RELATED SECTIONS

- A. Division 23 – General Mechanical Requirements.
- B. Division 23 – Instrumentation and controls for HVAC.
- C. Division 23 – Indoor Air Handling Units.
- D. Division 23 – Air Terminal Units.
- E. Division 23 – Testing and Balancing for HVAC.
- F. Division 23 – Commissioning of HVAC.
- G. Division 26 – Electrical Work.
- H. Standard Specifications and Codes: In addition to the requirements shown or specified, comply with the following applicable standard specifications, codes or ordinances:
 - 1. NFPA – National Fire Protection Association.
 - 2. UL – Underwriter's Laboratories.
 - 3. Rules and Regulations of the Michigan Department of Fire Prevention and Safety.
- G. Include all items of labor and material required to comply with such standards, codes or ordinances in accordance with the contract documents. Where quantities, sizes, or other requirements indicated on the drawings or herein specified are in excess of the standard or code requirements, the specification and drawings shall govern.

1.7 QUALIFICATIONS FOR THE EIWC

- A. Controls Installation Contractor: The EIWC's will be pre approved by WSU prior to bidding this project.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: EIWC contractor must be able to provide references, upon request, for similar projects (in size & scope) that were completed satisfactorily, in Michigan. Project names, owner contacts and companies who awarded this work to you shall all be provided upon request to WSU and/or the AE of record. EIWC contractor must be prepared to submit a minimum of three (3) satisfactorily completed projects, annually, for the past five (5) years.
- B. 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 for intended use.
- C. Comply with ASHRAE 135 for DDC system components.

1.9 SEQUENCING AND SCHEDULING

- A. Sequence work to ensure installation of components is complimentary to installation of similar components in other systems.
- B. Coordinate work with other Contractors and subcontractors to ensure system is completed and commissioned by the Date of Substantial Completion.
- C. Coordinate installation of system components with installation of mechanical systems equipment such as air handling units and air terminal units.

1.10 WARRANTY

- A. Provide as pre project general conditions.

1.11 CONTROL WIRING

- A. The EIWC is required to use the cable below. Refer to temperature control drawing ABAC Building Automation Cable Specification Catalog. If a wire type is required that is not referenced on the ABAC sheet then it is up to the EIWC to provide the appropriate wire for the application.
- B. The EIWC is required to tag all wiring. Wiring that is used for DDC control points should be tagged with abbreviated DDC point name from control submittal. If wire is to be demo'd make sure the wire is labeled "spare" or "not in use".

1.12 INSTALLATION

- A. Refer to project plans and DDC temperature control drawings for control wiring required and equipment locations.
- B. Install control devices per installation requirements of control device. Before installing, always refer to local codes.

ELECTRICAL INSTALLATION AND WIRING FOR HVAC TEMPERATURE AND LAB CONTROLS

26 0900 1

ELECTRICAL INSTALLATION AND WIRING FOR HVAC TEMPERATURE AND LAB CONTROLS

REVISION HISTORY	SIEMENS	45470 Commerce Ctr. Dr. Plymouth Twp., MI 48170 USA PHONE: 734.456.3800 FAX: 866.815.0749	WSU College of Pharm Generator Detroit, MI				0 SPEC2
			ENGINEER SFM	DRAFTER TAJ	CHECKED BY	INITIAL RELEASE 08/07/14	
ELECTRICAL INSTALL SPEC.							

Wayne State University

1.1 ELECTRICAL WIRING INSTALLATION BY THE EIWC (Project Plans and Specifications Prevail)

- A. Furnish and install ALL wiring and interlock wiring as specified and as shown on the project plans DDC temperature control drawings. Connect controls in accordance with DDC temperature control drawings.
- B. Installation minimum requirements:
 - 1. Mechanical Rooms & Penthouses Areas: EMT up ten feet, then exposed plenum I/O point wiring
 - 2. TEC Space Sensors: All cables furnished by Siemens, installed within wall construction without EMT.
 - 3. Other Space Sensors: I/O point wire in EMT for all non-accessible walls, approved plenum open wire in accessible walls.
 - 4. Ceiling Returns (accessible, permanent, acoustical): Approved plenum rated cable.
 - 5. Ceiling Returns (non-accessible) and all other inaccessible areas: All wiring in EMT.
 - 6. Power and low voltage wiring shall not be run in the same conduit.

ON-SITE TESTING

2.0

- A. Provide Owner-approved operation and acceptance testing of the complete system. The following shall witness the performance test:
 - 1. The EIWC - Electrical (controls) installation & wiring contractor
 - 2. The equipment manufacturers representative
 - 3. The Owner's agent
 - 4. The Owner
 - 5. Architect/Engineer
- B. Field Test: When installation of the system is complete, all systems shall be tested to their sequence of operation including all safety circuits.

END OF SECTION 26 0900

ELECTRICAL INSTALLATION AND WIRING FOR HVAC TEMPERATURE AND LAB CONTROLS

FOR REFERENCE ONLY

REVISION HISTORY	SIEMENS	45470 Commerce Ctr. Dr. Plymouth Twp., MI 48170 USA PHONE: 734.458.3800 FAX: 866.815.0749	WSU College of Pharm Generator		0 SPEC3			
			Detroit, MI					
	Siemens Industry, Inc. Building Technologies Division		ENGINEER SFM	DRAFTER TAJ	CHECKED BY	INITIAL RELEASE 08/07/14	LAST EDIT DATE 08/28/14	ELECTRICAL INSTALL SPEC.

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TCP 14	1	567-352	SIEMENS	567-352	#3 PNEU PANEL 24X24X9
Panel Mounted Devices					
AD 1	1	AD-2001	UNITED SECURITY	AD-2001	AUTO VOICE/PAGER DIALER
	1	AC-2P	UNITED SECURITY		AC/DC ADAPTER 12V W/PLUG
	1	IR-1	UNITED SECURITY		ISOLATION RELAY
	1	PP-1	UNITED SECURITY		POWER PACK FOR AVD
PS 1	1	SLS-12-017T	EMERSON		POWER SUPPLY, 120V, 12-15VDC, DIN RAIL
PTES 1	3	9001KR1U	SQUARE D		PUSH BUTTON, MOMENTARY, 30MM, 7 COLOR
	3	9001KA2	SQUARE D		CONTACT BLOCK 30MM N.O. 10A
RE 1	1	5YR26	DAYTON		RELAY,GP 4PDT, 12VDC 3A W/LED
	1	2A584	DAYTON		SOCKET-4P, SQUARE, 14 PIN
RE 2	1	5YR26	DAYTON		RELAY,GP 4PDT, 12VDC 3A W/LED
	1	2A584	DAYTON		SOCKET-4P, SQUARE, 14 PIN
RE 3	1	5YR26	DAYTON		RELAY,GP 4PDT, 12VDC 3A W/LED
	1	2A584	DAYTON		SOCKET-4P, SQUARE, 14 PIN
SB 1	1	4A238	RACO		UTILITY BOX 4"X2.125"X1.875"
	1	52835	HUBBELL		DUPLEX RECEPTACLE 20A, 125VAC
	1	4A241	RACO		DUPLEX RECEPTACLE COVER PLATE
UPS 1	1	PW5125 1500	POWERWARE	PW51251500	UPS, 1500VA, 1050 WATTS
	1	1FD93	CCI		POWER SUPPLY CORDS 12/3, 8 FT

SEQUENCE OF OPERATIONS FOR TESTING GENERATOR CONDITIONS MONITORED VIA THE SIEMENS APOGEE SYSTEM.

TESTING WILL PROVIDE GENERATOR "RUN" ALARM, "FAULT" ALARM, FUEL "RUPTURE" ALARM, FUEL "50%" ALARM, FUEL "80% ALARM. EACH ALARM ONCE TRIGGERED WILL PROVIDE A SIEMENS RENO PAGING ALARM AND GRAPHICAL COMMAND CENTER ALARM.

ADDITIONALLY, THE FUEL DIALER SYSTEM AND PHONE LINE WILL ALSO BE TESTED AND VERIFIED FOR PROPER OPERATION.

TEST #1: NORMAL RUNNING ALARM

START AND RUN GENERATOR FOR NORMAL MONTHLY TESTING. ONCE GENERATOR STARTED, GENERATOR INTERLOCK RELAY PROVIDES SIEMENS RENO PAGING AND GRAPHIC ALARMS AS SHOWN.
"GENERATOR RUN STATUS = ON" AND "GENERATOR RUN STATUS = OFF"

TEST #2: ALARM FAULT TEST

GENERATOR OFF AND PANEL SELECTOR SWITCH IN "AUTO". MOVE SELECTOR SWITCH TO "MANUAL RUN", (DELAY OCCURS THEN GENERATOR STARTS) NOW PUSH IN RED STOP BUTTON. THIS WILL FORCE GENERATOR INTO AN ALARM CONDITION. GENERATOR INTERLOCK RELAY PROVIDES SIEMENS RENO PAGING AND GRAPHIC ALARMS AS SHOWN. TO RESET ALARM, PULL OUT RED STOP BUTTON, SWITCH SELECTOR SWITCH TO "AUTO". NOTE THAT GENERATOR SELECTOR SWITCH SHOULD ALWAYS BE IN THE "AUTO" POSITION.
"GENERATOR ALARM = ALARM" AND "GENERATOR ALARM = NORMAL"

TEST #3: TANK RUPTURE ALARM

PRESS AND HOLD THE MOMENTARY WALL MOUNTED "RUPTURE" PUSH BUTTON (PB). GENERATOR INTERLOCK RELAY PROVIDES SIEMENS RENO PAGING AND GRAPHIC ALARMS AS SHOWN. NOTE THAT THE RENO ALARM SHOULD BE BROADCASTED WITHIN 1 MINUTE. RELEASE PB ONCE COMPLETED.
"FUEL TANK RUPTURE = ON" AND "FUEL TANK RUPTURE = OFF"

TEST #4: 50% FUEL LEVEL ALARM

FUEL LEVEL 50% TEST ACTIVATES BOTH THE LOCAL PHONE DIALER AND SIEMENS SYSTEM. CONTACT GLENN WILLIAMS (313-350-9195) AT D&W FUEL SUPPLY COMPANY (313-834-2580). INFORM GLENN THAT HE WILL RECEIVE A 50% FUEL CALL OUT FROM THE RESPECTIVE BUILDING. GLENN WILL BE STANDING BY AND WILL NEED TO CALL BACK THE WSU ONSITE PERSON ONCE EACH ALARM HAS BEEN RECEIVED. TEST PROCEDURE AS FOLLOWS: PRESS AND HOLD THE MOMENTARY WALL MOUNTED "50% TEST" PUSH BUTTON (PB). GENERATOR INTERLOCK RELAY PROVIDES PHONE DIALER, SIEMENS RENO PAGING AND GRAPHIC ALARMS AS FOLLOWS: NOTE THAT ALARM SHOULD BE BROADCASTED WITHIN 1 MINUTE. CONTINUE TO HOLD PB UNTIL GLENN RECEIVES, ACCEPTS AND THEN RETURNS HIS CONFIRMATION CALL THAT PHONE DIALER WAS RECEIVED. PHONE MESSAGE READS.... WSU RESPECTIVE BUILDING GENERATOR STARTED, DELIVER FUEL WITHIN 4 HOURS.
"50% FUEL LEVEL = ALARM" AND "50% FUEL LEVEL = NORMAL"
NOTE: 2 MINUTE DELAY BEFORE RETURN TO NORMAL ON RENO ALARM.

TEST #5: 80% FUEL LEVEL ALARM

FUEL LEVEL 80% TEST ACTIVATES BOTH THE LOCAL PHONE DIALER AND SIEMENS SYSTEM. CONTACT GLENN WILLIAMS (313-350-9195) AT D&W FUEL SUPPLY COMPANY (313-834-2580). INFORM GLENN THAT HE WILL BE RECEIVING A 80% FUEL CALL OUT FROM THE COMPUTER SERVICES BUILDING. GLENN WILL BE STANDING BY AND WILL NEED TO CALL BACK THE WSU ONSITE PERSON ONCE EACH ALARM HAS BEEN RECEIVED. TEST PROCEDURE AS FOLLOWS: PRESS AND HOLD THE MOMENTARY WALL MOUNTED "80% TEST" PUSH BUTTON (PB). GENERATOR INTERLOCK RELAY PROVIDES PHONE DIALER, SIEMENS RENO PAGING AND GRAPHIC ALARMS AS FOLLOWS: NOTE THAT ALARM SHOULD BE BROADCASTED WITHIN 1 MINUTE. CONTINUE TO HOLD PB UNTIL GLENN RECEIVES, ACCEPTS AND THEN RETURNS HIS CONFIRMATION CALL THAT PHONE DIALER WAS RECEIVED. PHONE MESSAGE READS.... WSU RESPECTIVE BUILDING GENERATOR FUEL LEVEL LOW, DELIVER FUEL IMMEDIATELY.
"80% FUEL LEVEL = ALARM" AND "80% FUEL LEVEL = NORMAL"
NOTE: 2 MINUTE DELAY BEFORE RETURN TO NORMAL ON RENO ALARM.

DDC MONITORING POINTS PER GENERATOR:

GENERATOR RUN	DIGITAL INPUT VIA DRY CONTACT
GENERATOR FAULT	DIGITAL INPUT VIA DRY CONTACT
BATTERY CHARGER FAULT	DIGITAL INPUT VIA DRY CONTACT

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GENERATOR/FUEL OIL CONTROL							

DDC MONITORING POINTS FOR FUEL STORAGE TANK:

FUEL LEVEL 80% DIGITAL INPUT VIA DRY CONTACT
 FUEL LEVEL 50% DIGITAL INPUT VIA DRY CONTACT
 TANK RUPTURE ALARM DIGITAL INPUT VIA DRY CONTACT
 LOW DETECTION ALARM DIGITAL INPUT VIA DRY CONTACT
 TANK LEVEL ANALOG INPUT VIA 4-20MA SIGNAL

RENO - REMOTE ENUNCIATION THRU APOGEE

SET UP RENO GROUP FOR GENERATORS. "COMP CTR GENERATOR"

1. SUPERVISOR PAGE (COMMAND CENTRAL)
2. OWNER DEFINED
3. OWNER DEFINED
4. OWNER DEFINED

DEFINE THE FOLLOWING POINTS FOR RENO

GENERATOR RUN - "GEN # IS RUNNING" (USE RUNNING AND OFF AS CHANGE OF STATES)
 RETURN TO NORMAL - "GEN # IS OFF"

GENERATOR ALARM - "GEN # FAILED TO START"

LOW FUEL LEVEL (DAY TANK) - "GEN # (ARE DAY TANKS NUMBERED)"

50% FUEL LEVEL - "FUEL TANK 50% ALARM"

80% FUEL LEVEL - "FUEL TANK 80% ALARM"

NO ATS POINTS DEFINED FOR RENO

ANALOG PHONE DIALER INFORMATION

THE FOLLOWING FOUR NUMBERS TO BE PROGRAMMED INTO THE "DIALER" PANEL

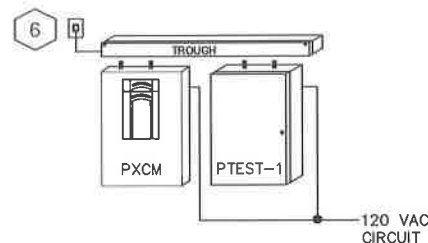
1. ATLAS OIL COMPANY (FUEL DELIVERY) 800-878-2000
2. KATIE WELLMAN (ACCOUNT REPRESENTATIVE)-(OFFICE) 313-662-3621
(CELL) 313-932-6893
3. WSU SUPERVISOR (COMMAND CENTER) 313-577-4844
4. WSU PUBLIC SAFETY (NON-EMERGENCY) 313-577-2224

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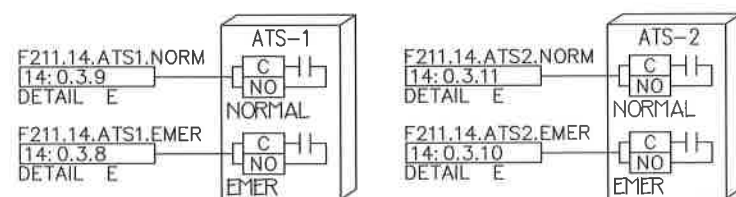
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			SFM	TAJ		08/07/14	08/26/14	
			GENERATOR/FUEL OIL CONTROL					

PANEL INSTALLATION NOTES:

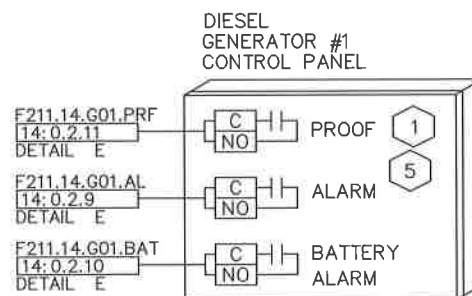
- *DDC PANELS PROVIDED BY SIEMENS.
- *TROUGH PROVIDED BY INSTALLING ELECTRICAL CONTRACTOR.
- *120VAC CIRCUITS PROVIDED BY DIV. 16 ELECTRICAL
- *SEE JOB DOCUMENTS FOR CIRCUIT LOCATIONS AND NUMBERS.
- *120VAC SHALL BE WIRE INTO THE PANELS WITHOUT RUNNING IN THE WIRING TROUGH.
- *HIGH VOLTAGE & LOW VOLTAGE CABLE SHALL NOT MIX IN WIRING TROUGH.
- *DDC PANELS TO BE MOUNTED AND TERMINATED BY INSTALLING ELECTRICAL CONTRACTOR.
- *INSTALLING ELECTRICAL CONTRACTOR TO PROVIDE MINIMUM OF (2) 1" NIPPLES BETWEEN EACH PANEL AND TROUGH.
- *REFER TO ALTRM DRAWING FOR WIRING TAGGING REQUIREMENTS.
- *USE ONLY SIEMENS APPROVED WIRING.



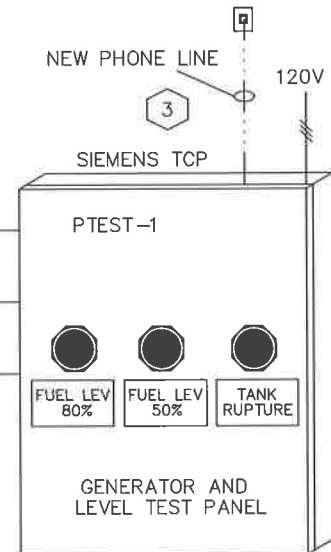
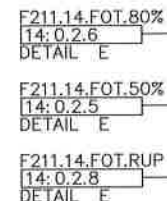
	IP ADDRESS	SUBNET MASK	GATEWAY
PXCM-X	XX.X.X.XX	XXX.XXX.XXX.X	XX.X.X.X



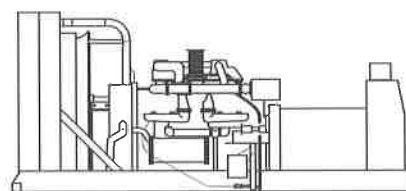
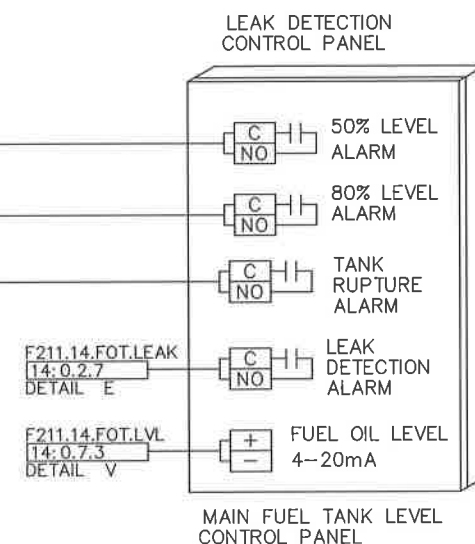
1 001B ATS



2 001B GENERATOR MONITORING



3 001B FUEL OIL STRG. TANK MONITORING



4 001B DIESEL GENERATOR MONITORING

COORDINATE FINAL EQUIPMENT TERMINATIONS WITH GENERATOR & FUEL OIL VENDOR.

Reference Only

This drawing is for reference only. This drawing must be used only to add additional detail to what is being provided by the engineer of record. Not all terminations, wire pulls or interlocks are shown in these diagrams as this will be dependent on the equipment purchased by others. Once equipment submittals are secured, the final drawings will reflect all work necessary to provide a full and functioning control system as outline in the plans and spec. It is the bidders responsibly to review all contract documents provided by engineer of record to ensure that a complete scope is bid. Quantity of items and location of devices/panels that are not clearly spelled out in the drawings must be field verified to ensure that the project is properly bid. It is assumed that the bidder of the temperature controls electrical installation is knowledgeable in such work and requires minimal guidance. Siemens assumes no responsibility or risk for bidders not fully understanding the scope or extend of the work required.

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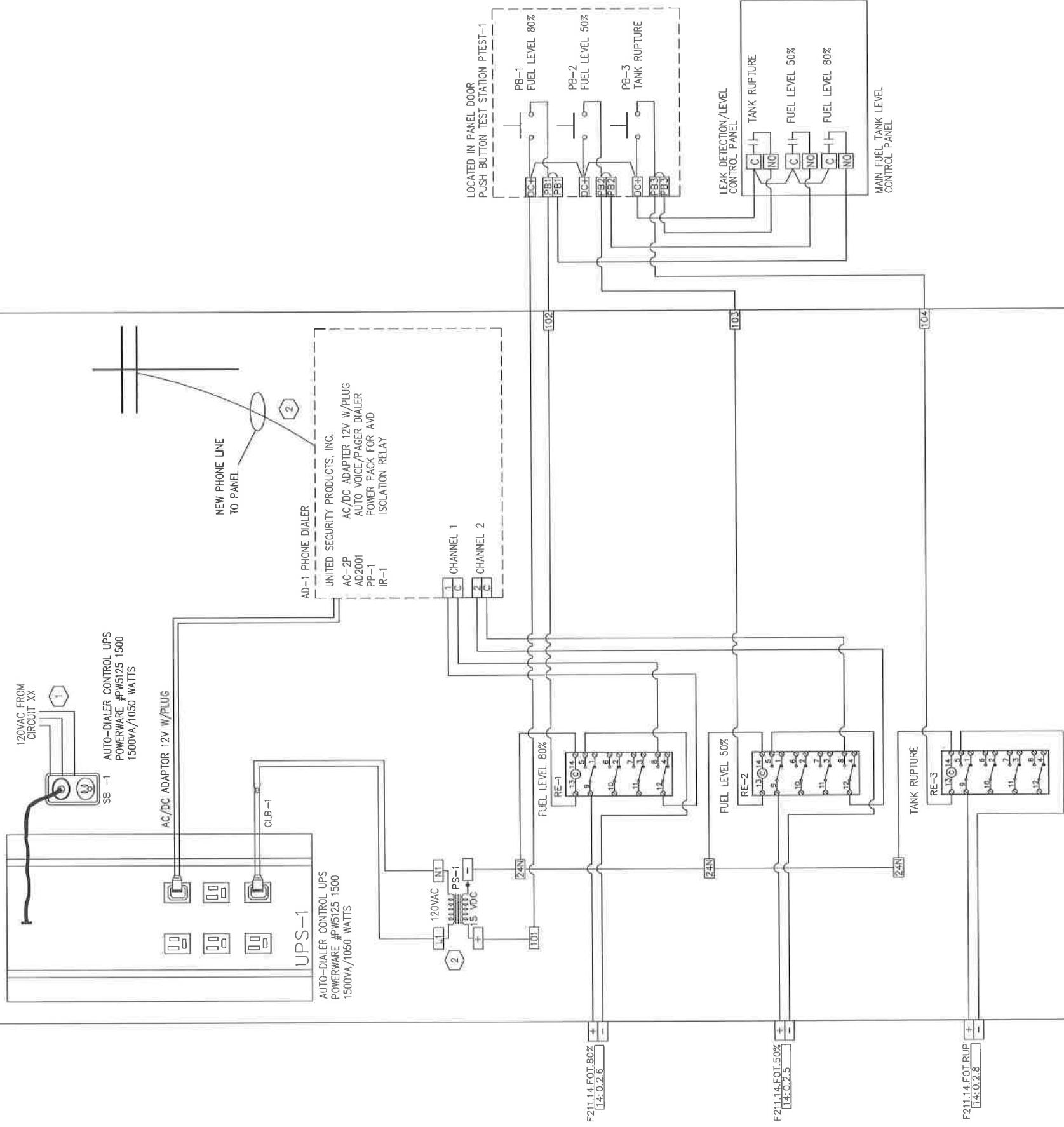
GENERATOR/FUEL OIL CONTROL

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FIELD PANEL PXCW-XX

TEMPERATURE CONTROL PANEL TCP-XX

FIELD WIRING



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- INSTALLATION NOTES:**
- 120VAC POWER CIRCUIT NUMBER TO BE VERIFIED.
 - PROVIDE DEDICATED PHONE LINE FOR DIAL-OUT TO FUEL DELIVERY SYSTEM.
 - ALL WIRING TO MEET REQUIREMENTS OF STANDARD WIRING SPECIFICATIONS DRAWINGS.

1 FUEL OIL DELIVERY TEST SYSTEM
001C

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