

ELECTRICAL SPECIFICATIONS

1. GENERAL CONDITIONS

A. THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL LABOUR, ELECTRICAL MATERIAL, TOOLS, EQUIPMENT ETC., REQUIRED TO COMPLETE ALL WORK SHOWN ON THE DRAWINGS AND HEREIN SPECIFIED. THE WORK SHALL BE IN ACCORDANCE WITH RULES AND REGULATIONS OF ALL AUTHORITIES HAVING LEGAL JURISDICTION OVER THE WORK. THIS CONTRACTOR SHALL PROVIDE ANY SMALL ITEMS OF WORK NOT SPECIFICALLY CALLED FOR BUT REQUIRED TO COMPLETE THE INTENDED INSTALLATION.

2. SCOPE OF WORK

THE WORK SHALL CONSIST OF, BUT NOT BE LIMITED TO THE FOLLOWING: A. SUPPLY AND INSTALLATION OF LIGHTING FIXTURES, SWITCHES, EXIT AND EMERGENCY BATTERY LIGHT UNITS, FIRE ALARM SYSTEM, TELEPHONE, DATA AND TELEVISION OUTLETS AND RECEPTACLES.

3. CODES, PERMIT AND INSPECTION

A. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR AND SHALL OBTAIN ALL PERMITS, INSPECTIONS, ETC. AS REQUIRED BY ALL AUTHORITIES HAVING JURISDICTION OVER THIS WORK AND SHALL PAY FOR THE AFORESAID. THESE COSTS SHALL BE INCLUDED IN THE TENDER PRICE.

4. DRAWINGS

THIS CONTRACTOR SHALL PREPARE, AT HIS OWN EXPENSE ANY LARGE SCALE WORKING DRAWINGS WHICH MAY BE REQUIRED BY THE EXAMINING AUTHORITIES.

5. AS-BUILT DRAWINGS

THIS CONTRACTOR SHALL KEEP A SEPARATE SET OF REDLINE DRAWINGS ON SITE AND NOTE ALL CHANGES AND DEVIATIONS FROM THE ORIGINAL DESIGN. TWO SETS OF THESE PLANS SHOWING ALL AS-BUILT CONDITIONS SHALL BE FORWARDED TO THE OWNER AT THE COMPLETION OF THIS CONTRACT AND BEFORE APPLYING FOR FINAL PAYMENT.

6. SHOP DRAWINGS

SUBMIT ELECTRONIC COPIES OF MANUFACTURER'S SHOP DRAWINGS FOR REVIEW BY THE ENGINEER OF RECORD. THESE SHOP DRAWINGS SHALL CONSIST OF DISTRIBUTION EQUIPMENT, LIGHTING FIXTURES, EMERGENCY BATTERY UNITS AND OTHER SPECIAL EQUIPMENT.

7. EXAMINATION OF SITE

A. THIS CONTRACTOR SHALL VISIT THE SITE OF THE PROJECT AND FAMILIARIZE HIM/HERSELF. B. ANY DEVIATION AND/OR CONFLICTS ON SITE ESPECIALLY CONCERNING THE DISTRIBUTION DIAGRAM(S) AS SHOWN ON THE PLANS, SHALL BE REPORTED TO THE ENGINEER PRIOR TO SUBMITTING TENDER. C. ALL DIMENSIONS MUST BE CHECKED AND VERIFIED ON SITE.

8. CONSTRUCTION SCHEDULE

A. THIS CONTRACTOR SHALL SCHEDULE AND PERFORM HIS WORK TO MEET THE COMPLETION SCHEDULE AS SET OUT BY THE OWNERS. ANY OVERTIME WORK SHALL BE INCLUDED IN HIS TENDER. B. CONTRACTOR SHALL ADVISE OF ANY SHUTDOWNS OR DISRUPTIONS OF SERVICE WITH A MINIMUM OF 5 WORKING DAYS NOTICE.

9. REVISIONS AND EXTRAS

NO ADDITIONAL MONEY OVER THE CONTRACT PRICE SHALL BE PAID UNLESS AN APPROVED CHANGE ORDER IS ISSUED BY THE ENGINEER. CLAIMS FOR EXTRAS SHALL BE SUBMITTED WITH A COMPLETE BREAKDOWN OF MATERIAL, LABOUR, HOURLY RATES, ETC.

10. CLEAN UP

THIS CONTRACTOR SHALL BE RESPONSIBLE TO PERIODICALLY REMOVE ALL DEBRIS AND TO KEEP THIS AREA CLEAN AT ALL TIMES.

11. DELIVERY DATES

THIS CONTRACTOR SHALL PLACE AN ORDER FOR ALL MATERIAL AND EQUIPMENT IMMEDIATELY AFTER SIGNING OF THE CONTRACT. HE/SHE SHALL SUBMIT A LIST OF DELIVERY DATES FOR EACH TYPE OF EQUIPMENT WITHIN 7 DAYS OF AWARDED THE CONTRACT. THE LIST SHALL INCLUDE MANUFACTURER'S NAMES, MATERIAL DATES MUST MEET CONTRACTOR SCHEDULE SET BY OWNER.

12. EQUIPMENT AND MATERIAL

ALL EQUIPMENT AND MATERIAL, UNLESS SPECIFICALLY NOTED OTHERWISE, SHALL BE NEW AND WITHOUT BLEMISH OR DEFECT. ALL MATERIAL AND EQUIPMENT SHALL BE OF THE TYPE SUBJECT TO FACTORY MUTUAL UNDERWRITER'S LABORATORIES OF CANADA OR CANADIAN STANDARDS ASSOCIATION INSPECTION AND APPROVAL AND SHALL BEAR U.L.C. OR C.S.A. LABELS.

13. TESTING

A. PERFORM TEST ON EACH SYSTEM TO THE SATISFACTION OF THE ENGINEER AND SUBMIT TEST RESULTS FOR APPROVAL PRIOR TO THE FINAL ACCEPTANCE OF THE WORK. B. PANELS SHALL BE BALANCED TO WITHIN 5% OF LOAD PER PHASE. GROUNDING SHALL BE AS REQUIRED BY ELECTRICAL CODE. C. TEST ALL SYSTEM GROUNDING CONDUCTORS FOR PHASE TO GROUND LOADS. METERS SHALL READ LESS THAN ONE AMPERE. SUBMIT TESTS PRIOR TO COMPLETION.

14. DEMONSTRATION OF THE SYSTEM

DEMONSTRATE THE FUNCTION AND OPERATION OF EACH SYSTEM TO THE MAINTENANCE STAFF OR THE OWNERS REPRESENTATIVE.

15. IDENTIFICATION

A. PROVIDE LAMACOID IDENTIFICATION NAMEPLATES ON ALL ELECTRICAL EQUIPMENT. THESE SHALL BE WHITE WITH BLACK ENGRAVED LETTERS AND SHALL BE INSTALLED WITH SCREWS, LAMACOID TO IDENTIFY EQUIPMENT NAME AND LOAD SERVED. B. EACH ELECTRICAL PANEL SHALL HAVE A TYPEWRITTEN DIRECTORY SHOWING LIGHTS OR EQUIPMENT CONNECTED TO EACH CIRCUIT. DIRECTORIES SHALL BE MOUNTED ON THE INSIDE OF THE PANEL DOOR WITH A TRANSPARENT PLASTIC COVER.

16. COORDINATION

THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF THE INSTALLATION OF EQUIPMENT, CONDUIT WORKS, LIGHTING FIXTURES, ETC. WITH OTHER TRADES PRIOR TO THE ACTUAL INSTALLATION.

17. ACCESSIBILITY

A. ALL WORK SHALL BE INSTALLED SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIRS. B. A MINIMUM WORKING SPACE OF 1 METER WITH SECURE FOOTING SHALL BE PROVIDED AND MAINTAINED ABOUT ELECTRICAL EQUIPMENT. THE MINIMUM HEAD ROOM OF WORKING SPACES SHALL BE 2.2 METERS.

18. RESPONSIBILITY

THIS TRADE SHALL BE RESPONSIBLE FOR HIS/HER WORK UNTIL THE COMPLETION AND FINAL ACCEPTANCE. FOR REPLACING ANY ITEM THAT MAY BE DEFECTIVE, DAMAGED, LOST OR STOLEN WITHOUT ADDITIONAL COST TO THE OWNER OR DELAY TO THE COMPLETION OF THE PROJECT.

19. WARRANTY

THIS CONTRACTOR SHALL WARRANT ANY WORK AND APPARATUS INSTALLED UNDER THIS CONTRACT AGAINST ALL DEFECTS OR WORKMANSHIP AND MATERIAL FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE BY THE OWNER.

20. FIRE PROOFING

ALL PENETRATIONS THROUGH FIRE RATED ASSEMBLIES ARE TO BE FIRE STOPPED WITH AN APPROVED FIRE RATING SYSTEM TO SUIT THE FIRE RATED ASSEMBLY. INSTALL AS PER MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS. PROVIDE SHOP DRAWINGS FOR REVIEW PRIOR TO COMPLETING WORK.

21. CUTTING, PATCHING, AND PAINTING

A. ALL CUTTING, PATCHING AND PAINTING FOR ELECTRICAL WORK SHALL BE DONE BY AN ELECTRICIAN. OBTAIN APPROVAL PRIOR TO CUTTING STRUCTURAL MEMBERS, AND UPON REMOVAL OF CONDUITS, WIRING EQUIPMENT, LIGHTING, OR WIRING DEVICES. PATCH ALL HOLES AND MATCH EXISTING FINISHES. B. ALL FLOOR TILES DAMAGED DURING CONSTRUCTION TO BE REPLACED.

22. CONDUIT AND WIRING

A. CONDUIT SIZES SHALL BE AS INDICATED ON THE PLANS AND SHALL NOT BE REDUCED IN SIZE WITHOUT AUTHORIZATION. CONDUIT IN FINISHED AREAS SHALL BE CONCEALED. ALL CONDUIT SHALL BE INSTALLED PARALLEL TO BUILDING LINES. B. UNLESS OTHERWISE NOTED, CONDUIT FOR PANELS AND BRANCH CIRCUIT WIRING SHALL BE THIN WALL EMT. C. CONDUITS SHALL BE INSTALLED AT A MINIMUM OF 6" (150mm) FROM UN-INSULATED HEATING PIPES. D. ALL WIRING TO BE COPPER UNLESS NOTED OTHERWISE. BRANCH WIRING SHALL BE NO.12 AWG UP TO 70 FT. (21.4M) AND NO.10 AWG FROM 71 FT. (21.4M) TO 120FT. (36.6M). FOR DISTANCES LONGER THAN 120 FT., THE VOLTAGE DROP SHALL BE CALCULATED AT 3%.

E. INSTALL ALL WIRING CONCEALED IN CONDUIT. USE SIX CABLE IN PARTITION WALLS AND IN CEILING SPACE. SIX MAY BE USED IN EXPOSED AREAS FOR MAX 3FT LENGTH AND ONLY TO DEAD END FEED SUSPENDED LIGHTING FIXTURES CABLE TIED OFF TO HANGER RODS. F. NO CONDUITS SHALL BE RUN IN FLOOR SLAB UNLESS NOTED OTHERWISE. UNDER SLAB RACEWAYS SHALL BE RUN ABOVE PLUMBING BUT MIN. 150mm BELOW UNDERSLAB OF CONCRETE SLAB C/W SAFETY RIBBON FULL LENGTH. G. CONDUIT INSTALLED OUTDOORS OR IN DAMP LOCATIONS SHALL BE RIGID PVC AND SHALL BE PROVIDED WITH SEALING FITTING WHERE CONDUIT PASSES THROUGH OUTSIDE WALL AND/OR ROOF.

23. RACEWAYS

HORIZONTAL RACEWAYS MAY BE RUN UNDER SLAB WITH PERMISSION FROM ENGINEER. SCHEDULE 40 PVC HEAVY WALL RACEWAY TO BE USED. RUN SEPARATE GROUND CONDUCTOR IN ALL PVC RACEWAYS.

24. SLEEVES

A. DUPLEX RECEPTACLES SHALL BE WHITE, GROUNDING TYPE RATED FOR 15A/120V PASS AND SEYMOUR MODEL/CRIS-W1 UNLESS OTHERWISE SPECIFIED ON PLANS. THESE SHALL HAVE BREAK-OFF LINE TO ALLOW FOR SPLIT WIRING OR 2 CIRCUITS. B. CONDUIT (OTHER THAN INCOMING) SHALL BE EMT (THINWALL) AND COMPLETE WITH BUSHING TO PROTECT CABLE. CONDUIT IN CEILING SPACE SHALL BE FT6-FLAME SPREAD RATE. MINIMUM SIZE FOR VOICE/DATA IS 27mm (REFER TO CONDUIT SECTION OF THE SPECIFICATION). C. LIGHT SWITCHES 5-8" WIDE AND 4" HIGH SHALL BE SPECIFICATION GRADE EQUAL TO PASS AND SEYMOUR MODEL 6635VC. EQUIPMENT MANUFACTURERS OF SWITCHES ARE AS FOLLOWS: ARROW HART - SPECIFICATION GRADE. HUBBELL - SPECIFICATION GRADE. D. COVER PLATES IN FINISHED AREAS SHALL BE PASS AND SEYMOUR MODEL #E-SL1 AND S18 STAINLESS STEEL. NUMBER OF GANG AS REQUIRED. E. THE OWNER OR ENGINEER HAS THE RIGHT TO RELOCATE OUTLETS UP TO 10 FT. (3.0M) IN ANY DIRECTION PRIOR TO INSTALLATION WITHOUT EXTRA CHARGE.

25. POWER DISTRIBUTION

A. THE POWER DISTRIBUTION SYSTEM SHALL BE AS SHOWN ON THE PLANS AND AS HEREIN AFTER SPECIFIED. B. SAFETY SWITCHES: C. THESE SHALL BE HEAVY DUTY, FUSIBLE, QUICK MAKE, QUICK BREAK, VOIDABLE COVER INTERLOCK, LOCKABLE IN "OFF" POSITION WITH NEUTRAL BAR WHERE REQUIRED. D. FUSE HOLDERS SHALL BE AS REQUIRED TO SUIT RATING AND TYPE FUSES SPECIFIED. E. ALL WIRING INSTALLED IN PANELS SIX TIMES CONTINUOUS CURRENT BREAK AT RATED VOLTAGE. F. ENCLOSURE SHALL BE NEMA 1 EXCEPT WHERE WEATHER-PROOF SWITCHES ARE REQUIRED. THESE SHALL BE NEMA 3R. G. ALL SWITCHES SHALL BE OF THE SAME MANUFACTURER AND SHALL BE LATCH, SQUARE "D", OR SIEMENS. H. FLUSH OR SURFACE MOUNTED AS INDICATED COMPLETE WITH DOOR LOCK, LATCH, AND TYPEWRITTEN DIRECTORY. I. CIRCUIT BREAKERS SHALL HAVE THERMAL MAGNETIC TRIP PROTECTION WITH BIMETALLIC ELEMENTS FOR THE DELAY OVERLOAD PROTECTION. TWO AND THREE POLE BREAKERS SHALL BE BOLT-IN FIELD INTERCHANGEABLE. J. ALL PANELS SHALL BE OF THE SAME MANUFACTURING AND SHALL BE CUTLER HAMMER, SQUARE "D", OR SIEMENS. K. ANY BRANCH CIRCUIT BREAKERS SHALL BE RATED FOR "SWITCHING DUTY", MINIMUM 10 KIAC RATED.

26. BRANCH PANELS

A. THE BRANCH PANELS SHALL BE OF THE VOLTAGE INDICATED ON THE DRAWINGS AND SHALL BE COMPLETE WITH BRANCH BREAKERS AS SHOWN OR IMPLIED ON THE PLAN. MAIN BREAKERS TO BE PROVIDED WHERE INDICATED. B. FLUSH OR SURFACE MOUNTED AS INDICATED COMPLETE WITH DOOR LOCK, LATCH, AND TYPEWRITTEN DIRECTORY. C. CIRCUIT BREAKERS SHALL HAVE THERMAL MAGNETIC TRIP PROTECTION WITH BIMETALLIC ELEMENTS FOR THE DELAY OVERLOAD PROTECTION. TWO AND THREE POLE BREAKERS SHALL BE BOLT-IN FIELD INTERCHANGEABLE. D. ALL PANELS SHALL BE OF THE SAME MANUFACTURING AND SHALL BE CUTLER HAMMER, SQUARE "D", OR SIEMENS. E. ALL BRANCH CIRCUIT BREAKERS SHALL BE RATED FOR "SWITCHING DUTY", MINIMUM 10 KIAC RATED.

27. MECHANICAL EQUIPMENT

UNLESS OTHERWISE SHOWN ON PLANS, FOR MECHANICAL EQUIPMENT PROVIDED BY THE MECHANICAL TRADE SHALL PROVIDE: 1. THE NECESSARY POWER DISTRIBUTION EQUIPMENT AT THE ELECTRICAL ROOM. 2. THE NECESSARY CONDUIT AND WIRE TO THE MECHANICAL EQUIPMENT LOCATION. 3. A TERMINATING DISCONNECT SWITCH. 4. ANY MISCELLANEOUS ITEMS NECESSARY TO COMPLETE THE WORK AS SHOWN ON THE DRAWINGS. 5. TO COORDINATE EXACT LOCATIONS WITH THE MECHANICAL TRADE AND RELATED DRAWINGS. 6. ALL CONDUIT, WIRING, AND LABOUR FROM THE TERMINATING DISCONNECT SWITCH TO THE MECHANICAL EQUIPMENT INCLUDING STARTERS AND LOW VOLTAGE CONTROLS SHALL BE PROVIDED BY THE MECHANICAL TRADE. 7. UNLESS OTHERWISE INDICATED, ALL SPECIFIED ELECTRICAL HEATING EQUIPMENT TOGETHER WITH THE CONTROL THERMOSTATS, CONDUIT, WIRE, ETC. SHALL BE PROVIDED BY THE ELECTRICAL TRADE. 8. THE ELECTRICAL TRADE SHALL VERIFY ALL MOTOR CONNECTIONS FOR PROPER PHASE ROTATION, WHERE APPLICABLE.

28. WIRING DEVICES

A. DUPLEX RECEPTACLES SHALL BE WHITE, GROUNDING TYPE RATED FOR 15A/120V PASS AND SEYMOUR MODEL/CRIS-W1 UNLESS OTHERWISE SPECIFIED ON PLANS. THESE SHALL HAVE BREAK-OFF LINE TO ALLOW FOR SPLIT WIRING OR 2 CIRCUITS. B. CONDUIT (OTHER THAN INCOMING) SHALL BE EMT (THINWALL) AND COMPLETE WITH BUSHING TO PROTECT CABLE. CONDUIT IN CEILING SPACE SHALL BE FT6-FLAME SPREAD RATE. MINIMUM SIZE FOR VOICE/DATA IS 27mm (REFER TO CONDUIT SECTION OF THE SPECIFICATION). C. LIGHT SWITCHES 5-8" WIDE AND 4" HIGH SHALL BE SPECIFICATION GRADE EQUAL TO PASS AND SEYMOUR MODEL 6635VC. EQUIPMENT MANUFACTURERS OF SWITCHES ARE AS FOLLOWS: ARROW HART - SPECIFICATION GRADE. HUBBELL - SPECIFICATION GRADE. D. COVER PLATES IN FINISHED AREAS SHALL BE PASS AND SEYMOUR MODEL #E-SL1 AND S18 STAINLESS STEEL. NUMBER OF GANG AS REQUIRED. E. THE OWNER OR ENGINEER HAS THE RIGHT TO RELOCATE OUTLETS UP TO 10 FT. (3.0M) IN ANY DIRECTION PRIOR TO INSTALLATION WITHOUT EXTRA CHARGE. F. DO NOT INSTALL WIRING DEVICES BACK-TO-BACK IN WALL PROVIDE A MINIMUM OF 150mm HORIZONTAL CLEARANCE BETWEEN BACK OF BOXES. G. LOCATE LIGHT SWITCHES ON LATCH SIDE OF DOOR. H. PROVIDE 1-BAR GRID SUPPORT BRACKETS FOR ALL DEVICES INSTALLED IN T-BAR CEILING. I. DO NOT INSTALL WIRING DEVICES BACK-TO-BACK IN WALL PROVIDE A MINIMUM OF 150mm HORIZONTAL CLEARANCE BETWEEN BACK OF BOXES. J. LOCATE LIGHT SWITCHES ON LATCH SIDE OF DOOR. K. PROVIDE 1-BAR GRID SUPPORT BRACKETS FOR ALL DEVICES INSTALLED IN T-BAR CEILING.

29. LOW VOLTAGE CEILING

A. FUSE SIZES AND TYPES SHALL BE AS INDICATED ON THE PLANS AND DESCRIBED IN THIS SECTION. EQUIPMENT HOLDING THE FUSES SHALL BE AS SPECIFIED, OTHERWISE ANY CHANGES NEEDED TO CONVERT THE EQUIPMENT TO HOLD THE SPECIFIED FUSES SHALL BE AT THE CONTRACTORS EXPENSE. EQUIPMENT SHALL BE PROVIDED TO HOLD THE SPECIFIED FUSES. B. FUSES SHALL BE C.S.A. APPROVED HCR. TYPE, VOLTAGE AS REQUIRED, FORM 1 CLASS "J" NON-RENEWABLE, DUAL ELEMENT AEROLEX, 2 SPARES OF EACH TYPE TO BE SUPPLIED. C. CIRCUIT BREAKERS SHALL HAVE THERMAL MAGNETIC TRIP PROTECTION WITH BIMETALLIC ELEMENTS FOR THE DELAY OVERLOAD PROTECTION. TWO AND THREE POLE BREAKERS SHALL BE BOLT-IN FIELD INTERCHANGEABLE. D. ALL PANELS SHALL BE OF THE SAME MANUFACTURING AND SHALL BE CUTLER HAMMER, SQUARE "D", OR SIEMENS. E. ALL BRANCH CIRCUIT BREAKERS SHALL BE RATED FOR "SWITCHING DUTY", MINIMUM 10 KIAC RATED.

30. LIGHTING FIXTURES AND LAMPS

A. PROVIDE FIXTURES AND LAMPS AS INDICATED ON THE FIXTURE SCHEDULE AND/OR AS SPECIFIED UNDER THIS SECTION. THESE MUST AND SHALL BE COMPLETE WITH ALL NECESSARY HANGERS, LAMPS, SUPPORTS, ETC. B. CONTRACTOR SHALL INCLUDE IN HIS/HER TENDER THE FIXTURE (S) THAT ARE BEING SPECIFIED. IF AN ALTERNATE MANUFACTURER IS NAMED, IT IS MANDATORY THAT THE FIXTURE BE EQUIVALENT IN ALL RESPECTS, I.E. SAME LENS QUALITY, FRAME, PERFORMANCE, FINISH, CONSTRUCTION EQUIVALENT, ETC. ALTERNATE MANUFACTURERS OF ALTERNATE FIXTURE TYPES MUST BE OFFERED AS AN ALTERNATE ONLY TO THE BASE BID, WITH SEPARATE PRICE STATED IN TENDER. LOW BIDDER WILL BE DETERMINED ON THE BASIS OF THE SPECIFIED ITEM NOT ON "ALTERNATE SAVINGS". C. COORDINATE THE MOUNTING AND LOCATION OF LUMINAIRES WITH OTHER TRADES TO AVOID CONFLICTS. D. LIGHTING FIXTURES IN MECHANICAL AND ELECTRICAL ROOMS SHALL BE INSTALLED, ALL EQUIPMENT IS IN PLACE. E. LOCAL SWITCHES: 1050mm. F. WALL RECEPTACLES: - GENERAL: 450mm - ABOVE TOP OF CONTINUOUS BASEBOARD HEATER: 200mm - ABOVE TOP OF COUNTERS OR COUNTER SPLASH BACKS: 150mm - IN MECHANICAL ROOMS: 1400mm. G. TELEPHONE AND INTERPHONE OUTLETS: 450mm. H. PANELS/BAR(S) AS REQUIRED BY CODE OR AS INDICATED. I. WALL MOUNTED TELEPHONE AND INTERPHONE OUTLETS: 1100mm TO HIGHEST OPERABLE CONTROL. J. FIRE ALARM STATIONS: 1200mm. K. FIRE ALARM BELLS: 2400mm. L. TELEVISION OUTLETS: 450mm. M. EXIT LIGHTS: 2400mm. N. EMERGENCY LIGHT HEADS: 2400mm.

31. VOICE/DATA CABLING SYSTEM

A. PROVIDE A COMPLETE CAT 6 VOICE / DATA HORIZONTAL CABLING SYSTEM, COMPLETE WITH ALL CABLES, TERMINATIONS, RJ45 JACKS, COVERPLATES AND PATCH PANELS TO SUIT THE VOICE / DATA LAYOUT AS SHOWN ON THE PLANS. B. ALL CABLING AND EQUIPMENT TO BE INSTALLED AND TERMINATED AS PER MANUFACTURER'S RECOMMENDATIONS. C. WHERE INSTALLED IN RETURN AIR PLENUMS, CAT 6 CABLING TO BE FT6 RATED. D. PROVIDE FINAL TESTING RESULTS, CERTIFICATION AND MANUFACTURER'S WARRANTY UPON COMPLETION. E. EACH CABLE TO BE PERMANENTLY LABELED AT EACH END, COORDINATE LABEL WORDING WITH ENGINEER AND OWNER PRIOR TO INSTALLATION. F. ALL DATA JACKS TO BE LABELED AT EACH END, COORDINATE LABEL WORDING WITH ENGINEER AND OWNER PRIOR TO INSTALLATION. CONTRACTOR TO PROVIDE ONE EFT AND ONE AFT PATCH CORD FOR EACH VOICE / DATA JACK. PATCH CORD TO BE USED TO PATCH NETWORK EQUIPMENT AT PATCH PANELS AND WORKSTATION EQUIPMENT AT JACKS. G. PROVIDE HOOKS FOR ALL CABLES RUNNING IN FREE AIR. H. ENSURE ADEQUATE CLEARANCE BETWEEN CABLES AND ELECTRICAL AND MECHANICAL EQUIPMENT IS MAINTAINED AND AS PER MANUFACTURER'S REQUIREMENTS.

32. VOICE/DATA CONDUIT SYSTEM

A. PROVIDE SYSTEMS AS SHOWN ON THE PLANS AND Riser. B. THIS CONTRACTOR SHALL PROVIDE AND/OR COORDINATE THE SIZE, TYPE, AND LOCATION OF THE INCOMING TELEPHONE CONDUIT WITH THE TELEPHONE COMPANY. C. CONDUIT (OTHER THAN INCOMING) SHALL BE EMT (THINWALL) AND COMPLETE WITH BUSHING TO PROTECT CABLE. CONDUIT IN CEILING SPACE SHALL BE FT6-FLAME SPREAD RATE. MINIMUM SIZE FOR VOICE/DATA IS 27mm (REFER TO CONDUIT SECTION OF THE SPECIFICATION). D. A MINIMUM OF 2 LONG RADIUS 90 DEGREE BENDS SHALL BE PROVIDED BETWEEN PULL BOXES. E. PULL STRING SHALL BE PULLED AND LEFT IN EACH CONDUIT TO FACILITATE THE FUTURE PULLING OF PULL ROPE THEN CONDUCTORS.

33. ACCESS DOORS

A. PROVIDE ACCESS DOOR FOR ALL CONCEALED ELECTRICAL EQUIPMENT AND CONNECTIONS. B. LOCATE ACCESS DOORS TO ALLOW FOR PROPER OPERATION, INSPECTION, ADJUSTMENT, AND SERVICING. C. ACCESS DOORS TO BE FLUSH MOUNTED. PROVIDE MINIMUM 600mmx600mm WHERE BODY ENTRY IS REQUIRED. PROVIDE MINIMUM 300mmx300mm WHERE HAND ENTRY IS REQUIRED. D. COORDINATE FINISH WITH ENGINEER. STAINLESS STEEL ACROSS DOORS TO BE INSTALLED IN TILE OR MARBLE FINISHES. PRIME AND PAINTABLE STEEL ACCESS DOORS TO BE PROVIDED IN ALL OTHER AREAS. E. ALL ACCESS DOORS SHALL BE OF SAME MANUFACTURER AND SHALL BE NAILOR OR APPROVED EQUIVALENT.

34. OPERATIONAL AND MAINTENANCE MANUALS

THE ELECTRICAL CONTRACTOR SHALL PROVIDE TO OWNER 3 COPIES OF OPERATING MANUALS AND MAINTENANCE INSTRUCTIONS FOR ALL ELECTRICAL EQUIPMENT INCLUDING GUARANTEES.

35. EMERGENCY LIGHTING AND EXIT SIGNS

MINIMUM WIRE SIZE FROM BATTERY UNIT TO DC REMOTE HEAD (S) SHALL BE NO.10 AWG.

36. MOUNTING HEIGHTS

MOUNTING HEIGHT OF EQUIPMENT IS FROM FINISHED FLOOR TO CENTRELINE OF EQUIPMENT UNLESS SPECIFIED OR INDICATED OTHERWISE.

INSTALL ELECTRICAL AT THE FOLLOWING HEIGHTS UNLESS INDICATED OTHERWISE.

- 1. LOCAL SWITCHES: 1050mm
2. WALL RECEPTACLES: - GENERAL: 450mm - ABOVE TOP OF CONTINUOUS BASEBOARD HEATER: 200mm - ABOVE TOP OF COUNTERS OR COUNTER SPLASH BACKS: 150mm - IN MECHANICAL ROOMS: 1400mm
3. TELEPHONE AND INTERPHONE OUTLETS: 450mm
4. PANELS/BAR(S) AS REQUIRED BY CODE OR AS INDICATED
5. WALL MOUNTED TELEPHONE AND INTERPHONE OUTLETS: 1100mm TO HIGHEST OPERABLE CONTROL
6. FIRE ALARM STATIONS: 1200mm
7. FIRE ALARM BELLS: 2400mm
8. TELEVISION OUTLETS: 450mm
9. EXIT LIGHTS: 2400mm
10. EMERGENCY LIGHT HEADS: 2400mm

37. FIRE ALARM SYSTEM

DESCRIPTION: THIS CONTRACTOR TO SUPPLY AND INSTALL A NEW FIRE ALARM SYSTEM AS FOLLOWS: - ELECTRICALLY SUPERVISED - TWO STAGE - CLOSED CIRCUIT - NON CODED - ZONE ANNUNCIATED - ADDRESSABLE - CLASS A WIRING. THE NEW CONTROL PANEL TO CARRY OUT FIRE ALARM AND PROTECTION FUNCTIONS INCLUDING RECEIVING ALARM SIGNALS, SIGNALING A GENERAL ALARM, SUPERVISING SYSTEM CONTINUOUSLY, ACTUATING ZONE ANNUNCIATORS, AND INDICATING SUPERVISORY AND TROUBLE SIGNALS. PROVIDE ONE CONTROL PANEL AND ALL DETECTION DEVICES. THE SYSTEM SHALL OPERATE SO THAT OPERATION OF ANY ALARM INITIATING DEVICE SHALL: - CAUSE AN ALERT SIGNAL TO SOUND - CAUSE AN ALARM SIGNAL TO SOUND IF ALERT SIGNAL HAS NOT BEEN ACKNOWLEDGED WITHIN 5 MINUTES OF INITIATION OF ALERT SIGNAL - TRANSMIT SIGNAL TO REMOTE MONITORING AGENCY - DISPLAY ZONE OF ALARM DEVICE ON CONTROL PANEL. THE SYSTEM SHALL OPERATE SO THAT OPERATION OF ANY SUPERVISORY INITIATING DEVICE SHALL: - CAUSE A VISUAL AND AUDIBLE TROUBLE ALERT SIGNAL AT THE CONTROL PANEL - FIRE ALARM SYSTEM TO OPERATE ON 120V TWO (2) WIRE OPERATION - UPON AC FAILURE, CONTROL PANEL TO SWITCH AUTOMATICALLY OVER TO BATTERY BACKUP, WHEN AC IS RESTORED, THE BATTERIES ARE TO RECHARGE THEMSELVES AUTOMATICALLY.

38. FIRE ALARM TESTING

THE COMPLETE SYSTEM SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS AND THE MANUFACTURER'S RECOMMENDATIONS. INSTALLATION SHALL BE IN ACCORDANCE WITH CAN/ULC 5524-06 STANDARD FOR THE INSTALLATION OF FIRE ALARMS. FINAL TESTING OF THE COMPLETE INSTALLATION SHALL BE CARRIED OUT BY THE SYSTEM MANUFACTURER WITH ASSISTANCE PROVIDED BY THE ELECTRICAL CONTRACTOR IN ACCORDANCE WITH CAN/ULC 5537-04 "VERIFICATION FOR FIRE ALARM SYSTEM INSTALLATIONS". FINAL FIRE ALARM VERIFICATION REPORT TO BE SUBMITTED TO ENGINEER FOR REVIEW. A COPY TO BE INSERTED INTO OPERATION AND MAINTENANCE MANUALS.

ELECTRICAL SYMBOLS

Table of electrical symbols and their descriptions, including symbols for electrical panel, cable TV junction boxes, voice outlets, data outlets, fire alarm system components, and various lighting fixtures.

1. THESE DRAWINGS MUST BE CHECKED BY THE CUSTOMER OR CONTRACTOR. ANY ERRORS OR OMISSIONS MUST BE REPORTED IN WRITING TO STEENHOFF BUILDING SERVICES GROUP PRIOR TO COMMENCEMENT OF CONSTRUCTION. 2. OWNER OR CONTRACTOR MUST CHECK AND VERIFY ALL SITE CONDITIONS BEFORE PROCEEDING WITH THE WORK. 3. ALL DIMENSIONS SHOWN ON THESE DRAWINGS MUST BE CHECKED AGAINST ALL OTHER PROJECT DRAWINGS. ALL DISCREPANCIES MUST BE REPORTED TO THE CONSULTANT BEFORE PROCEEDING WITH THE WORK. 4. FOR CONSTRUCTION PURPOSES, USE ONLY THE LATEST APPROVED DRAWINGS LABELLED 'ISSUED FOR CONSTRUCTION'. 5. DO NOT SCALE THE DRAWINGS. 6. DIMENSIONS ARE TO THE INSIDE FACE OF STUD AND OUTSIDE FACE OF EXTERIOR FINISHED U.O.D.

Table with columns: TRUE NORTH, PROJECT NORTH

REVISION SCHEDULE

Table with columns: No., DESCRIPTION, DATE

Table of electrical symbols and their descriptions, including symbols for electrical panel, cable TV junction boxes, voice outlets, data outlets, fire alarm system components, and various lighting fixtures.

Project Status:

PRELIMINARY

Soal:

Table of electrical symbols and their descriptions, including symbols for electrical panel, cable TV junction boxes, voice outlets, data outlets, fire alarm system components, and various lighting fixtures.



Steenhoff Building Services Group 126 Mississauga Street East Orillia, ON L3V 1V7 Tel: 705-325-5400 Fax: 705-325-8400 Website: www.steenhoffbuilding.com

Project:

CARLING COMMUNITY HALL

Address: 2 CARLING BAY WEST ROAD, CARLING, ONTARIO

Project No:

17-023

Drawn By: Author Date: JUNE 2017

Chkd By: Checker Scale: As Indicated

Dwg Title:

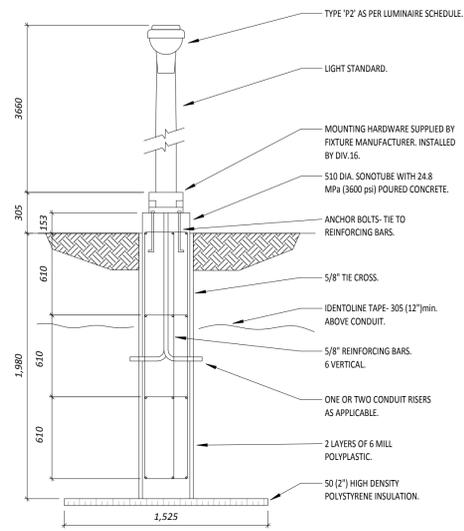
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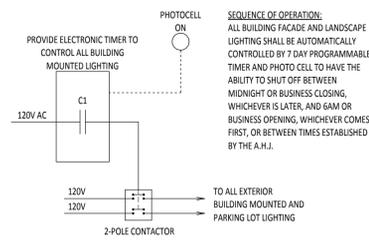
Revision:

ELECTRICAL LEGEND & SPECIFICATIONS

N:\13_P\Projects\2017\17-023 - New Rice Road & Community Centre\Drawings - MEP\17-023 Carling Community Centre & Rev. Revit.rvt

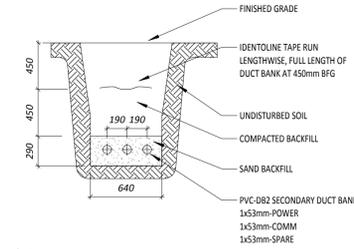


1 POLE MOUNTED LIGHT FIXTURE
N.T.S.



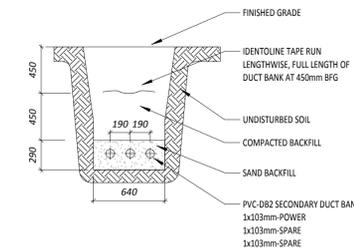
2 TIMER DETAIL
N.T.S.

SEQUENCE OF OPERATION:
ALL BUILDING FACADE AND LANDSCAPE LIGHTING SHALL BE AUTOMATICALLY CONTROLLED BY 7 DAY PROGRAMMABLE TIMER AND PHOTOCELL TO HAVE THE ABILITY TO SHUT OFF BETWEEN MIDNIGHT OR BUSINESS CLOSING, WHICHEVER IS LATER, AND 6AM OR BUSINESS OPENING, WHICHEVER COMES FIRST, OR BETWEEN TIMES ESTABLISHED BY THE A.H.J.



3 UNDERGROUND RACEWAY - 3 CONDUIT
N.T.S.

NOTE:
1. CABLE INSTALLATION TO BE AS PER O&S DIAGRAM D11
2. CONTRACTOR TO RETURN ALL FINISHED GRADE TO MATCH EXISTING AFTER INSTALLATION



4 SECONDARY UNDERGROUND RACEWAY - 3 CONDUIT
N.T.S.

NOTE:
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2. CONTRACTOR TO RETURN ALL FINISHED GRADE TO MATCH EXISTING AFTER INSTALLATION

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5. DO NOT SCALE THE DRAWINGS.
6. DIMENSIONS ARE TO THE INSIDE FACE OF STUD AND OUTSIDE FACE OF EXTERIOR FINISHED U.N.D.

TRUE NORTH PROJECT NORTH

REVISION SCHEDULE

No.	DESCRIPTION	DATE

Project Status:
PRELIMINARY

Seal:



Steenhof Building Services Group
126 Mississauga Street East
Orillia, ON L3V 1V7
Tel: 705-325-5400 Fax: 705-325-8400
Website: www.steenhofbuilding.com

Project:
CARLING COMMUNITY HALL

Address:
2 CARLING BAY WEST ROAD, CARLING, ONTARIO

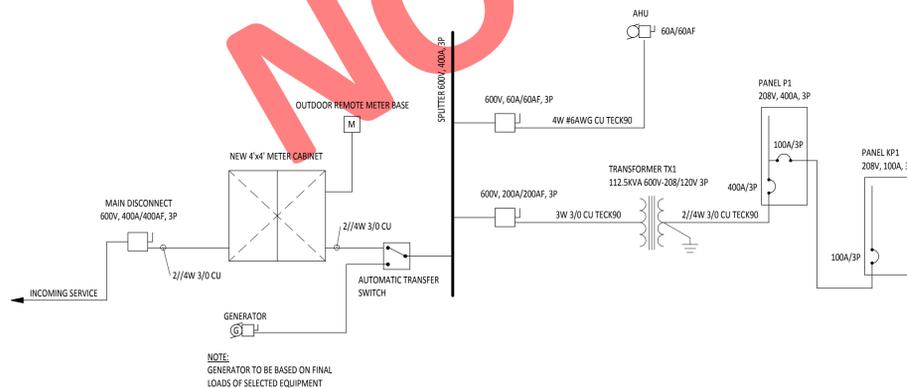
Project No:
17-023

Drawn By: Author Date: JUNE 2017

Chkd By: Checker Scale: As Indicated

Drawing No.: **E200**

Revision:



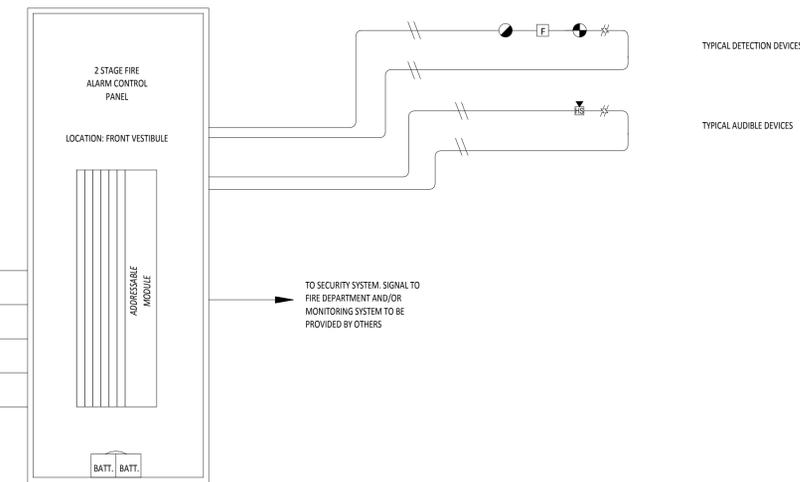
6 RISER DIAGRAM
N.T.S.

NOTE:
GENERATOR TO BE BASED ON FINAL LOADS OF SELECTED EQUIPMENT

RISER SYMBOLS LEGEND

- HEAT DETECTOR
- SMOKE DETECTOR
- SMOKE ALARM
- HORN
- FLOW SENSOR
- PRESSURE SENSOR
- SUPERVISED VALVE
- DOOR HOLD
- MANUAL PULL STATION
- STROBE HORN

- CONNECTION TO ELECTRO MAGNETIC DOOR HOLDERS
- CONNECTION TO GENERATOR
- CONNECTION TO KITCHEN FIRE SUPPRESSION CONTROLLER
- RUN TELEPHONE CABLE BACK TO MAIN TELEPHONE BACKBOARD IN 21mm CONDUIT
- RUN 120V POWER SOURCE IN 21mm CONDUIT BACK TO ELECTRICAL PANEL



GROUND FLOOR

8 FIRE ALARM RISER
N.T.S.

NOT FOR CONSTRUCTION

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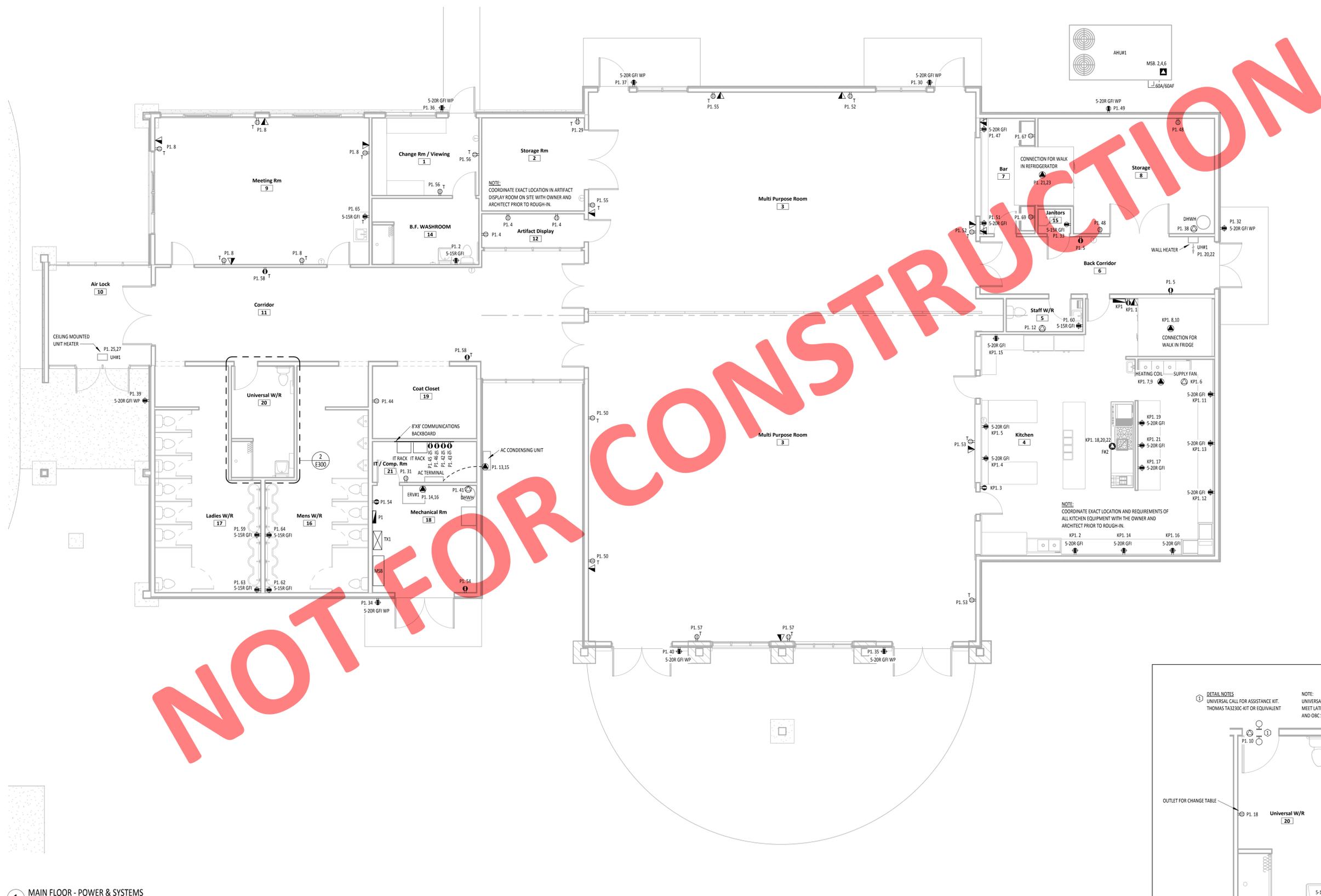
Project No.:
17-023

Drawn By: B.R. Date: JUNE 2017

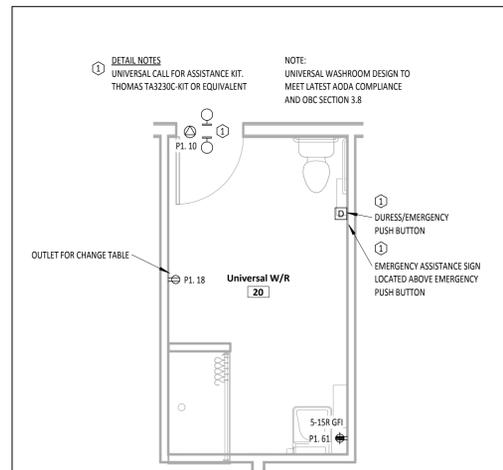
Chkd By: C.M. Scale: As Indicated

Dwg Title:
POWER & SYSTEMS

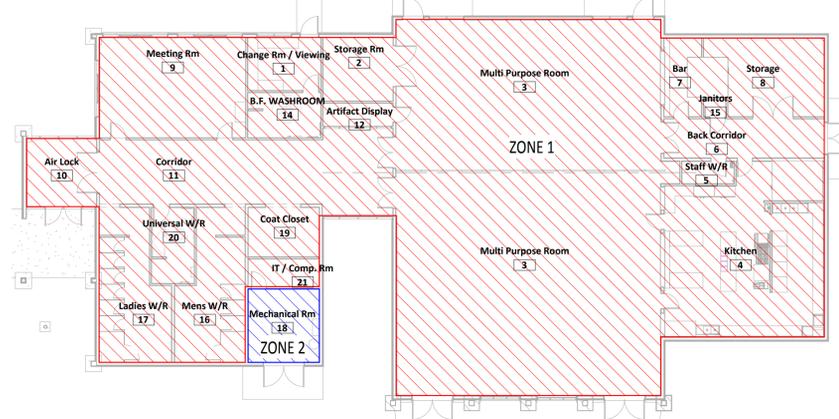
Revision:
E300



1 MAIN FLOOR - POWER & SYSTEMS
Scale: 1:75



2 UNIVERSAL WASHROOM LAYOUT
Scale: 1/4" = 1'-0"



2 FIRE ALARM ZONES
Scale: 1:200

Emergency Light Schedule					
DC Circuit	Type	Manufacturer	Model	Count	Wattage
DC-1	Emergency Light Battery Pack - Double Head	EMERGI-LITE	12ESL360	1	12 W
DC-1	Emergency Light Double Remote Head	EMERGI-LITE	EF150 D LIC	11	132 W
DC-1	Emergency Light Single Remote Head	EMERGI-LITE	EF150 LIC	3	18 W
DC-1	Wall Mounted Exit Sign	EMERGI-LITE	EASAU	6	12 W
DC-2	Emergency Light Battery Pack - Double Head	EMERGI-LITE	12ESL360	1	12 W
DC-2	Emergency Light Double Remote Head	EMERGI-LITE	EF150 D LIC	8	96 W
DC-2	Emergency Light Single Remote Head	EMERGI-LITE	EF150 LIC	2	12 W
DC-2	Wall Mounted Exit Sign	EMERGI-LITE	EASAU	4	8 W

Lighting Fixture Schedule		
Fixture Type	Manufacturer	Model
A1	Cooper Lighting	24GR-LD5-30-F1-UNV-L835-CD1-U
A2	Cooper Lighting	24GRW 24.4 LD4 48.35-A12125 UNV EDCL
A3	Lithonia Lighting	2BLT48 60L ADPZ21 LP835 N100
A4	Cooper Lighting	14 G R LD4 32 F1 UNV L835 CD 1 C/W DF-14-WU
A5	Cooper Lighting	22GR-LD5-20-A-UNV-L835-CD1-U
D1	Cooper Lighting	SLD606935 SLD6TRMTB2
D2	Cooper Lighting	SLD612935 SLD6TRMTB2
G1	Cooper Lighting	4SNLED-LD5-30SL-LC-UNV-L835-CD1-U
M2	Acuity Brands Lighting	STL4 48L E21 LP835 N100 STACGF72
P1	Lithonia Lighting	DLW 31
P2	Cooper Lighting	PRV A40 D UNV T4 B2 HSS
V1	Cooper Lighting	28CLED-LD4-20SL-F-UNV-L835-CD1
V2	Cooper Lighting	48CLED-LD4-20SL-F-UNV-L835-CD1

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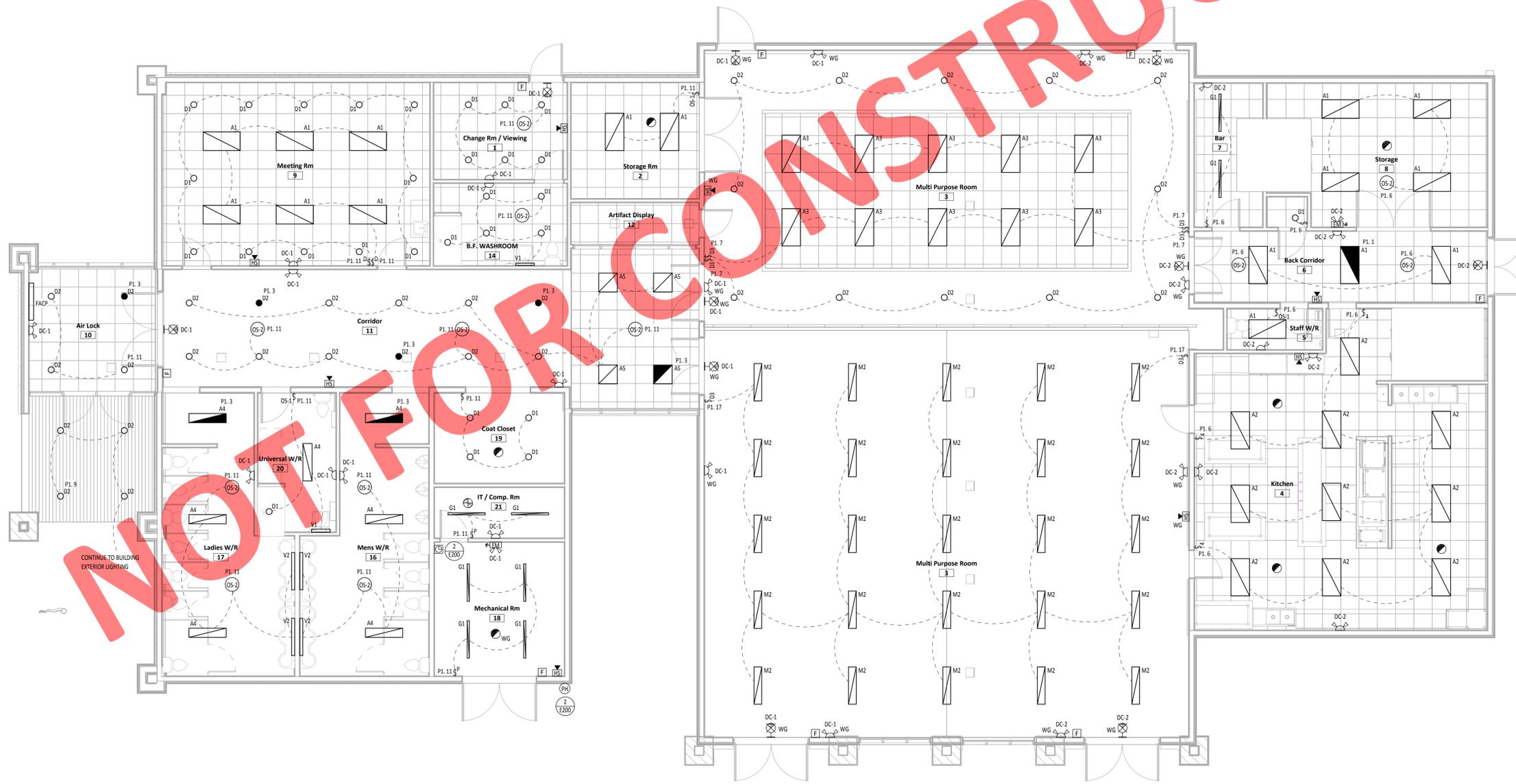
Drawn By: B.R. Date: JUNE 2017

Chkd By: C.M. Scale: As Indicated

Drawing No.:
E400

Revision:

1 MAIN FLOOR - LIGHTING & FIRE ALARM
Scale: 1:75



LIGHTING & FIRE ALARM

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