#### **Division 23 - HVAC SPECIFICATIONS** 23 05 01.00 - Common Requirements for HVAC

General Provisions of the Contract including General and Supplementary Conditions and General Requirements apply to work o

this section.

Scope The base bid includes furnishing all materials, labor, tools, and equipment and the performance of all work required to install a complete heating and air conditioning system as outlined herein.

Guarantee The contractor shall provide a guarantee in written form stating that all A pair of hangers shall be located at every transverse joint and work under this section shall be free of defective work, materials, or parts for a period of one year from the date of owner's final acceptance and shall repair, revise or replace at no cost to the owner any such defects occurring within the guarantee period. Contractor shall also state in written form that any items or occurrences arising during the guarantee period will be attended to in a timely manner and will in no

case exceed four (4) working days from date of notification by owner. Quality Assurance Provide a complete installation in conformance with the following standards.

ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers

NFPA: National Fire Protection Association SMACNA: Sheet Metal and Air Conditioning Contractors National

Association. Statewide Building Code

Permits, Fees, Inspections, Laws and Regulations Permits and fees of every nature required in connection with this work shall be obtained and paid for by this contractor who shall also pay for

all the installation fees and similar charges. Laws and regulations, which bear upon or affect the various branches of this work shall be complied with by this contractor and are hereby made a part of this contract. All work, which such laws require to be inspected, shall be submitted to the proper public official for inspection and a certificate of final approval must be furnished.

Tests and Adjustments No ducts, fixtures or equipment shall be concealed or covered until they have been inspected and approved by the Architect and the inspector who shall be notified by the contractor when the work is ready for inspection.

Work shall be completely installed, tested and leak tight before inspection is required. All tests shall be repeated to the satisfaction of those making the inspection.

Architectural coordination items Cutting and Patching: Cut and drill all openings in walls and floors required for the installation. Secure approval of Engineer before cutting

and drilling. Neatly patch all openings cut. Fire Caulking: Patching through fire rated walls and enclosures shall not diminish the rating of that wall or enclosure. Patch shall be equal to

rockwool, firestop, caulk or approved "rated" patch. Access Panels and Pathways: Furnish all access panels required for proper servicing of equipment. Provide access panels for all concealed

valves, vents, controls, cleanout doors, and sprinkler devices required by NFPA. Provide access panels for all fire and/or fire & smoke dampers. Provide frame as required for finish. Furnish panels to General Contractor. Exact locations to be approved by the Architect. Minimum size to be 12" x 12", units to be 16 gauge steel, locking device shall be screwdriver cam locks.

project conditions

Where new HVAC systems are required to be connected to existing HVAC systems, it is the contractor's responsibility to verify the location size, pressure, condition, and they shall verify that the existing HVAC system is indeed the correct and appropriate HVAC system before any Air balance and testing shall not begin until the system has been work is done. Provide all necessary camera scoping and dye testing as completed and is in full working order. The Contractor shall put all necessary. If there is any need for concern, if it is determined that the existing HVAC system is not a correct or appropriate HVAC system or not connected to a correct or appropriate HVAC system, if the condition of the existing HVAC system is not viable for re-use, or any other condition that would not allow the proper functioning of the new HVAC

system, the contractor shall notify the engineer in writing immediately via RFI and wait for direction before proceeding.

23 05 03.00 – submittals for HVAC

Where submittals are required by the Contract Documents, they shall be prepared and supplied in accordance with the Contract Documents. In addition to Division 01, the Contractor is advised to review and comply with the requirements articulated within each Division and

within each section of that Division Some Divisions may include a division-specific "Submittal Requirements for .... " section. Where this section exists, it articulates additional requirements for submittals that apply to the work of that

The following requirements help to identify, track and keep the project

organized for all parties involved. They are necessary to ensure a timely turnaround and an appropriate technical review. Submittals that do not conform to the administrative requirements are rejected and returned, without technical review. Requirements

Supply submittals for each section: Submittals shall be supplied on a section-by-section and type-by-type basis. For example, independent product data submittals shall be furnished for each section that requires product data submittals. Independent shop drawing submittals shall be 23 07 13.00 - Duct Insulation furnished for each section that requires shop drawings. Refer to the specifications for identification of which submittals are required for the project. Separate PDF file packages shall be supplied for each section, for each submittal type, where electronic submittals are required. Each PDF shall represent a single standalone submittal. Separately bound and identified submittals shall be provided where hardcopies are required.

Include a transmittal: Transmittals shall enumerate each submittal for each section of each type and iteration Include cover sheet / title page: The cover sheet shall include the

information identified in the contract documents. It shall be included a the first page of each electronic and/or hardcopy document-based submittal. An editable and printable PDF form created with editable fields and specification compliant appearance is available from KLH upon request. It is also downloadable from the KLH website at www.klhengrs.com.

Include an index: The index shall enumerate the contents of the submittal

Include checklists: Where checklists are included with the specifications, complete and include them within the appropriate

submittal. Supply complete submittals: Complete submittals of each type are required. Partial submittals will be rejected. Where a section requires a product data submittal, all product data for that section shall Double wall ductwork be supplied together, at one time, as one complete submittal. Do not send half the product data as one submittal and the other half as a separate one. When resubmittal is required (e.g. Revise and Resubmit) code. the revised submittal shall be more complete, more accurate and more Factory insulated flexible ductwork contract-compliant than its rejected predecessor. The submittal number Factory insulated plenums and casings

(for each section and type) shall increment for each subsequent submittal (00 - Original submission, 01 - First Resubmission. 02 -Second Resubmission, etc...). Resubmittals shall include a copy of the Factory insulated access panels and doors reviewers comments supplied with the prior submittal rejection and shall be amended with a description of the specific action taken to comply with the reviewer's comments. The absence of this on resubmittal is cause for rejection.

Name electronic files to match the submittal ID and cover sheet: The electronic file name of submittals shall match the submittal ID included on the submittals cover page. For example: The original/first product data submittal for Section 234116 would be labeled as " 234116.00-PD-00"; the first resubmittal of same shall be labeled "

234116.00-PD-01". The original/first shop drawings submittal file for the During startup, the fan shall run with the dampers in the full same section would be labeled "234116.00-SD-00"; the first resubmittal recirculation position. Provide occupied changeover sequence with of same shall be labeled "234116.00-SD-01" Use of Electronic Drawings from the Owner's Design Team

Plan drawings for the Project were created with AutoCAD and Revit. If expressly permitted by the Owner and the terms of the Contract, editable electronic versions of standard-scale, AutoCAD-based plan drawings may be made available for the creation of shop and as-built drawings.

Upon request when available, electronic versions of standard-scale, Navisworks (.dwf) and (.nwc) or AutoCAD 36 (.dwg) files may be made available for coordination purposes.

Due to the proprietary nature of internal design systems, editable available only in PDF, JPG or similar non-editable electronic form, at the sole discretion of the Design Professional.

The Request Drawings form can be accessed, filled out and submitted scheduled. As supply fan speed is set to low, damper shall fully open at the following internet address (scroll down to bottom of home page): allowing minimum outside air flow as scheduled. Provide motor http://www.klhengrs.com.

23 05 29.00 - Hangers and Supports for HVAC Piping and Equipment Support all ductwork and equipment by hangers or brackets properly from the building structure. Support from decking above is prohibited. Furnish structural steel members where required to support piping and equipment. No portion of piping or valves shall be supported by equipment.

Ductwork - Support by means of hangers as follows: Duct Width Hanger Size and Type Max. Spacing (#16 gage) 30 or less

31 to 60 (#14 gage)

elsewhere according to the table. 23 05 93.00 - Testing, Adjusting and Balancing for HVAC

Test, adjust, and balance the following mechanical systems:

Supply air systems, all pressure ranges

Return air systems. Exhaust air systems.

Test systems for proper sound and vibration levels. Quality Assurance

Codes and Standards:

AABC: "National Standards for Total System Balance". ASHRAE: ASHRAE Handbook, 2011 Applications, Chapter 38, Testing Adjusting, and Balancing. Submittals

Certified Reports: Submit testing, adjusting, and balancing reports bearing the seal and signature of the Test and Balance Engineer. The reports shall be certified proof that the systems have been tested. adjusted, and balanced in accordance with the referenced standards: are an accurate representation of how the systems have been installed; are a true representation of how the systems are operating at the completion of the testing, adjusting, and balancing procedures; and are 9. Smoke Detector an accurate record of all final quantities measured, to establish normal operating values of the systems. Follow the procedures and format

specified below: Final Report: Upon verification and approval prepare final reports, type written, and organized and formatted as specified below. Submit 2 complete sets of final report to the landlord.

Report Format: Report forms shall be those standard forms prepared by the referenced standard for each respective item and system to be tested, adjusted, and balanced.

Qualifications The contractor shall procure the services of an independent Balance and Testing Agency, approved by the Engineer, and a member of Associated Air Balance Council (AABC) or NEBB, which specializes in the balancing and testing of heating, ventilating and air conditioning systems, to balance, adjust and test all air and water systems and equipment as herein specified. All work by this agency shall be done under direct supervision of a qualified heating and ventilating Engineer employed by this agency. All instruments used by this agency shall be accurately calibrated and maintained in good working order. Sequencing and Scheduling

Test, adjust and balance air conditioning systems during summer season and heating systems during winter season, including at least a period of operation at outside conditions within 5 deg F wet bulb temperature of maximum summer design condition, and within 10 deg F dry bulb temperature of minimum winter design condition. Take final temperature readings during seasonal operation.

Check all filters for cleanliness, provide new as required. Check dampers (volume and fire) for correct and locked position, and temperature control for completeness of installation before starting fans. Place outlet dampers in full open position. Lubricate all motors and bearings. Check fan belt tension. Check fan rotation.

heating, ventilating and air conditioning systems and equipment into full the mechanical cooling shall be staged on. operation and shall continue the operation of same during each working 6. Heating Control day of testing and balancing. The contractor shall submit within 30 days after receipt of contract, 8 copies of submittal data for the testing

and balancing of the air conditioning, heating, and ventilating systems. The Air Balance and Testing Agency shall provide proof of having successfully completed at least five projects of similar size and scope. The air balancing contractor shall include the additional cost to change

every fan factory installed sheave, pulley and/or belt of in order to obtain the design air flows. Performing Testing, Adjusting and Balancing

accordance with the detailed procedures outlined in the referenced outdoor air intake damper is closed, the heating is off and the

minimum extent necessary to allow adequate performance of procedures.

Patch insulation, ductwork, and housings, using materials identical to those removed Seal ducts and piping, and test for and repair leaks.

Seal insulation to re-establish integrity of the vapor barrier.

Mark equipment settings, including damper control positions; valve indicators, fan speed control levers, and similar controls and devices, to Electrical contractor will provide power wiring. HVAC contractor shall show final settings. Mark with paint or other suitable, permanent identification materials. Retest, adjust, and balance systems subsequent to significant system

modifications, and resubmit test results.

All liners, insulation and adhesives shall have a flame spread index not more than 25 and a smoke developed index of not more than 50. Internal and External Insulation shall have a minimum installed thermal resistance value of R4.2 or code minimum, whichever higher. Rigid Fiberglass Ductwork Insulation: Glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IB, without facing

and with vapor barrier all-service jacket manufactured from kraft paper, reinforcing scrim aluminum foil and vinyl film Flexible Fiberglass Ductwork Insulation: Glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II, without facing

and with vapor barrier all-service jacket manufactured from kraft paper, reinforcing scrim, aluminum foil, and vinyl film. Vapor Barrier Material for Ductwork: Paper-backed aluminum-foil, except as otherwise indicated: strength and permeability rating

equivalent to factory-applied vapor barriers on adjoining ductwork insulation, where available; with following additional construction characteristics High Puncture Resistance: Low vapor transmission (for ducts in

exposed areas: Mech. Rooms, etc.) Moderate Puncture Resistance: Medium vapor transmission (for ducts in concealed areas)

All ductwork shall be insulated except

Fabric ductwork

Metal ducts with duct liner of sufficient thickness to comply with energy minimum.

Flexible connectors

Vibration control devices

Supply ductwork exposed in conditioned spaces excluding mechanical All electrical work as described in this specification shall be per the rooms, server rooms and electric equipment rooms Toilet exhaust, general exhaust and return ductwork in an insulated joist or attic space.

23 09 93.00 - Sequence of Operations for HVAC Control Packaged Rooftop Unit (5.0 tons and above)

. Startur The unit shall operate on a 7 day/night programmable thermosta

optimum start function. When the return air temperature reaches occupied setpoint (adjustable), the minimum outside air damper shall open to the controlled minimum outdoor air position. 2. Supply Fan Control

The supply fan shall be two staged and modulate up and down based on a call for heating or cooling Space Temperature Control

Provide 7-day programmable thermostat with digital display of space temperature and setpoint (+/- deg. F. adjustable), with override feature cables/wiring installed concealed by gypsum board, masonry or other and remote space temperature sensor.

Minimum Outside Air Control native-software versions of some drawings, including but not limited to During occupied mode, the minimum outside air damper shall be open All conduit, bridle rings, raceway, outlet boxes, etc. necessary for system diagrams and details will not be made available in an editable to the scheduled minimum outdoor air flow and modulate proportionally complete operational installation of control wiring shall be provided form. In these cases, electronic versions of the drawings may be made with the supply fan speed to maintain the scheduled minimum outside (furnished and installed) by the temperature control contractor in strict airflow. When the supply fan speed is set to high, outside air damper shall be partially closed allowing minimum outside air flow as

operated dampers.

Economizer Control Provide dual enthalpy economizer control. Economizer control shall be enabled whenever the outside air enthalpy is lower than the return air enthalpy. Enthalpy shall be calculated from sensors which are tied to the same controller for accuracy. During economizer mode, the outside Install circuits over 25 volt with color-coded No. 12 wire in electrical air damper shall modulate to 100% open. The economizer damper shall modulate open on a call for cooling and modulate closed on a call volt with color-coded No. 18 wire with 0.031" high temperature (105 for heating. The return damper shall modulate inversely with the economizer damper. Economizer shall have powered relief. 6. Coolina Control

Cooling shall be controlled to maintain space temperature setpoint. On shield over all. a call for cooling, the heating shall be off and supply fan speed shall be Smoke Detector low. On a further call for cooling, the economizer shall be enabled. On All duct smoke detectors will be furnished by electrical contractor, installed by the HVAC contractor, and wired by the electrical contractor a further call for cooling, disable the economizer and energize first stage cooling on. On a further call for cooling, the supply fan speed per local codes. HVAC contractor will interlock fan with smoke shall be high and energized second stage of cooling. Motor Operated Dampers 7. Heating Control

Heating shall be controlled to maintain space temperature setpoint. On All fresh air intakes and exhaust louvers shall have motor operated a call for heating, the mechanical cooling shall be off. On a further call for heating, the economizer mode shall be disabled. On a further call for heating, the supply fan shall be set to low speedand the electric heat shall modulate on via SCR controls. On a further call for heating, the supply fan shall be set to high speed and the electric heat shall modulate on via SCR controls. On a further call for heating, the supply fan shall be set to high speed. 8. Dehumidification

Exposed Ductwork Materials: Where ductwork is indicated to be Provide a hot gas reheat coil or duct mounted electric reheat coil for exposed to view in occupied spaces, provide materials which are free dehumidification. Provide space humidity sensor. When the space humidity rises above 60% (adjustable), provide full cooling and from visual imperfections including pitting, seam marks, roller marks, stains and discolorations, and other imperfections, including those modulate the hot gas reheat coil to maintain space temperature which would impair painting. Exposed ductwork which is to be painted Volume Control Damper: Provide manual controlled volume damper in setpoint. When the space humidity reaches setpoint, resume with normal heating & cooling operation. shall have paint grip applied. Sheet Metal: Except as otherwise indicated, fabricate ductwork from galvanized sheet steel, lock forming quality; with G 90 zinc coating and scheduled. When the smoke detector is alarmed, the system shall be alarmed and the air handler shall fail safe with manual reset. mill phosphatized for exposed locations. Minimum gauge shall be 24. Dampers utilized for pressure relief applications shall be tight seal, Miscellaneous Ductwork Materials Unoccupied Mode

Volume Dampers: Provide volume dampers in all branch ducts or as During the unoccupied mode of operation, the RTU shall go into night required for balancing to required air flows. setback mode.

 Night Setback/Shutdown At night setback/shutdown the RTU shall go to fail safe position. Fail safe position is defined by the following: The supply fan is off, the outdoor air intake damper is closed, the heating is off and the mechanical cooling is off. The supply fan shall cycle in conjunction with conical type tees. either the heating or cooling system to maintain a minimum/maximum space temperature depending on the season. Duct Sealant: Non-hardening, non-migrating mastic or liquid elastic sealant, type applicable for fabrication/installation detail, as space temperature depending on the season.

Packaged Rooftop Unit (3-ton unit) . Startur The unit shall operate on a 7 day/night programmable thermostat. During startup, the fan shall run with the dampers in the full recirculation position. Provide occupied changeover sequence with optimum start function. When the return air temperature reaches occupied setpoint (adjustable), the minimum outside air damper shall open to the controlled minimum outdoor air position.

Supply Fan Control The supply fan speed shall be constant, run continuously during Flexible Ducts Either spiral-wound spring steel with flameproof vinyl sheathing, or occupied mode and set to the required CFM. corrugated aluminum. Unless specifically mentioned, the maximum 3. Space Temperature Control length of flex duct on the supply equals 5 feet. Flex is not allowed for Provide 7-day programmable thermostat with digital display of space return, relief or exhaust applications. The flexible ducts indicated for temperature and setpoint (+/- deg. F. adjustable), with override feature use in the H.V.A.C. system shall conform to the requirements of UL 2518 induction-run type motor for belt driven fans. and remote space temperature sensor. for Class 0 or Class 1 flexible air ducts and shall be so identified. 4. Minimum Outside Air Control Where installed in unconditioned spaces other than return air plenums. Hooded dome typ During occupied mode the minimum outside air damper shall be open. provide 1" thick 1-1/2 lb. continuous flexible fiberglass sheath with vinyl Electrical: Provide factory-wired non-fusible type disconnect switch at Provide motorized outdoor air damper. 5. Coolina Control vapor barrier jacket. Cooling shall be controlled to maintain space temperature setpoint. On Installation is not permitted above drywall ceilings and inaccessible

for heating the electric heating coil shall be staged on. 7. Unoccupied Mode

During the unoccupied mode of operation, the RTU shall go into night setback mode. Night Setback/Shutdowr

instructions by manufacturers of lining and adhesive, and fasten with At night setback/shutdown the RTU shall go to fail safe position. Fail Perform testing and balancing procedures on each system identified, in safe position is defined by the following: The supply fan is off, the mechanical fasteners. Duct liner to be 3-lb density for acoustic requirements 1" thick or as noted. Size of ductwork shown on the mechanical cooling is off. The supply fan shall cycle in conjunction with drawings is free net area, outside dimer Cut insulation, ductwork, and piping for installation of test probes to the either the heating or cooling system to maintain a minimum/maximum increased if lined duct is used. space temperature depending on the season. Size of ductwork shown on the drawings is free net area, outside dimension of ducts will need to be increased if lined duct is used. Toilet Exhaust Fans (Manual)

Exhaust fans shall be controlled by local manual switch furnished, nstalled and wired by electrical contractor. When activated, exhaust fan motor damper shall open and fan shall start. (Indicated by EC on HECS schedule)

provide all the low voltage wiring of HVAC units and controls, hermostats and controllers. Thermostat shall be by the manufacturer of the HVAC unit (heat/cool/auto/off) with night setback. Provide plastic protective cover for all thermostats. Low Voltage Thermostats

Low voltage thermostats shall be furnished, installed and wired by the HVAC contractor. The electrical contractor shall provide 4" square x 1-1/2" deep wall outlet boxes (with single-gang rings) for all thermostats/sensors. The electrical contractor shall provide one 3/4" empty conduit from each thermostat/sensor location, turned out above accessible ceilings (in joist space or against overhead slab/deck). The HVAC/Temperature Control Contractor shall provide all other

necessary conduit, raceway and wiring related work. Conduit shall be identified in ceiling cavity and shall be provided with sweep bends, bushings and dragline. The HVAC/Temperature Control Contractor shall coordinate with the General Contractor to ensure thermal envelope is maintained at these

locations Line Voltage Thermostats

by the thermostat, in 3/4" conduit.

state and local codes

under Electrical Specifications.

under Electrical Specifications.

conduit. 3/4" minimum.

a call for cooling, the heating shall be off. On a further call for cooling, ceilings.

Heating shall be controlled to maintain space temperature setpoint. On a call for heating, the mechanical cooling shall be off. On a further call for heating, the economizer mode shall be disabled. On a further call

The electrical contractor shall provide 4" square x 1-1/2" deep wall thermostats. The electrical contractor shall provide line voltage power rated walls. wiring, from thermostat outlet box to equipment that is to be controlled

General Control Wiring Requirements and Installation Methods Except where specifically indicated otherwise above, the HVAC/Temperature Control Contractor shall provide all electrical work

as required for all temperature control related wiring (i.e. conduit, Electrical Specifications requirements. All conduit shall be 3/4"

Coordinate all thermostat/sensor locations in field (case by case) with Architect, Owner and Electrical Contractor to ensure that they are placed in locations that will not interfere with furniture, equipment,

artwork, wall-hung specialties, room finishes, etc. All thermostat/sensor wall locations indicated on HVAC drawings are schematic only and ust be verified case-by-case prior to rough-in. latest edition of the National Electrical Code (NEC) and per applicable

Where "free-air" installation methods (either exposed above the ceilings, in bridle rings or in cable trays) are permitted under Electrical

Specifications above ceilings, provide plenum-rated cables wherever lenum ceilings (if any) exist and install as defined under Electrical in electrical conduit regardless of what wiring methods are permitted

Where cable trays or bridle rings are provided by the electrical contractor for low voltage cables, these raceways may be utilized for control wiring by this contractor (provide special color coded jackets, products by one of the following: label cable jackets per Electrical Specifications and group control wiring Greenheck Fan Corporation cables together). Provide conduit drops from cable tray/bridle ring paths to wall outlet boxes and equipment unless directed otherwise

Regardless of permitted methods in Electrical Specifications, all inaccessible materials in walls or above ceilings shall be installed in

compliance with Electrical Specifications documents. Coordinate all work with all other applicable trades including the electrical contractor. Provide all required conduit work to and between equipment in a manner compliant with that described above (i.e. between VAV boxes, to boilers, starters, condensing units, etc. as applicable).

Install control wiring without splices between terminal points color-coded. Install in neat workmanlike manner, securely fastened. Install in accordance with National Electrical Code and per Electrical Specifications.

metallic tubing, per Electrical Specifications. Install circuits under 25 degs. F) plastic insulation on each conductor and plastic sheath over all. Install electronic circuits with color-coded No. 22 wire with 0.023" polyethylene insulation on each conductor with plastic-jacketed copper

dampers. Dampers shall be low leak with blade and edge seals. All motor operated dampers shall be provided and wired by the mechanical contractor unless otherwise noted. Provide all necessary transformers, contactors, controls and wiring for interlocking equipment Direct-Drive Units: Provide ball bearing motor encased in housing so to motor operated dampers.

23 31 13.00 - Metal Ducts Ductwork Materials

maximum 15 deg. change of direction per section. Unless specifically connected to ductwork, constructed of expanded metal in removable detailed otherwise, use 45 deg. laterals and 45 deg. elbows for branch frame takeoff connections. Where 90 deg. branches are indicated, provide

compounded and recommended by manufacturer specifically for sealing joints and seams in ductwork

Duct Cement: Non-hardening migrating mastic or liquid neoprene based cement, type applicable for fabrication/installation detail, as compounded and recommended by manufacturer specifically for cementing fitting components, or longitudinal seams in ductwork. Ductwork Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim and angles for support of ductwork.

Fabricatio Shop fabricate ductwork in 4, 8, 10 or 12-ft lengths, unless otherwise

indicated or required to complete runs. All ductwork shall be Pittsburgh Bird Screens: Provide removable bird screens, 1/2" mesh, 16-ga Construction with a minimum of thickness of 24 gauge. In addition ductwork used in systems over 3" W.G. shall have cold sealant applied. Pressure Relief: Dampers utilized for pressure relief applications shall Shop fabricate ductwork of gauges and reinforcement complying with SMACNA "HVAC Duct Construction Standards".

Lined Duct Fabricate ductwork with duct liner in each section of duct where indicated. Laminate liner to internal surfaces of duct in accordance with centrifugal roof ventilators of one of the following:

Duct Liner: Fibrous glass of thickness indicated. 3-lb density. All liners, scheduled. insulation and adhesives shall have a flame spread index not more than 25 and a smoke developed index of not more than 50. Duct Liner Adhesive

Duct Liner Fasteners: Comply with SMACNA HVAC Duct Construction Standards. Installation of Metal Ducty

rated 3" and under; 1% for systems rated over 3") and noiseless (no

objectionable noise) systems, capable of performing each indicated Accessories: Provide manufacturer's standard roof jack, v service. Install each run with minimum number of joints. Align ductwork transition fittings as indicated on drawings or schedules. ternal surfaces smooth. Support ducts rigidly with suitable ties, races, hangers and anchors of type which will hold ducts

true-to-shape and to prevent buckling. Support vertical ducts at every aling: Seal all longitudinal seams, S's and drives and all joints with

mastic or cement. Install according to SMACNA standards. Balancing Dampers: The sheet metal contractor shall be fully sible for installing balancing dampers in the ductwork, (whether Prefabricated Roof Curbs

The balancing sub-contractor shall provide direction and assistance in modified if necessary to comply with requirements. determining locations where dampers are required. Additional dampers, Fabricate structural framing for units of structural quality sheet steel, if required shall be installed at no additional cost to the owner. Wall Penetrations: Seal and pack around all ducts and piping sleeves

outlet boxes at 48" above finished floor (with single-gang rings) for all which pass through walls that extend to bottom side of structure and Field Fabrication: Complete fabrication of work at project as necessary Clean and paint units with manufacturer's standard rust-inhibitive metal to match shop-fabricated work and accommodate installation

requirements. Routing: Locate ductwork runs, except as otherwise indicated vertically and horizontally and avoid diagonal runs wherever possible. Run ductwork in shortest route which does not obstruct useable space superimposed vertical loads. raceway, outlet boxes, junction boxes, wiring, etc.) in accordance with or block access for servicing building and its equipment. Hold ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building. Limit clearance to 1/2" Gage and Height: Fabricate units of metal gage and to height above where furring is shown for enclosure or concealment of ducts, but allow roof surface as indicated. for insulation thickness, if any. Where possible, locate insulated ductwork for 1" clearance outside of insulation. Wherever possible in finished and occupied spaces, conceal ductwork from view, by locating Provide pressure treated wood nailer, not less than 1-5/8" thick and of

in mechanical shafts, hollow wall construction or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as specifically shown. Coordinate layout with suspended ceiling and lighting layouts and

similar finished work. Electrical Equipment Spaces: Do not route ductwork through transformer vaults and their electrical equipment spaces and

enclosures. Penetrations: Where ducts pass through interior partitions and exterior ecifications. Install low voltage circuits, located in concrete slabs and walls, and are exposed to view, conceal space between construction asonry walls, in inaccessible locations, or exposed in occupied areas, opening and duct or duct insulation with sheet metal flanges of same gage as duct. Overlap opening on 4 sides by at least 1-1/2". Fasten to

duct and substrate. All dampers shall be low leakage with edge and blade seals. Damper manufacturers are subject to specification compliance. Provide

Nailor Industries

Ruskin Company Young Regulator Company

Coordination: Coordinate duct installations with installation of accessories, dampers, coil frames, equipment, controls and other associated work of ductwork system.

Installation of Duct Liner General: Install duct liner in accordance with SMACNA HVAC Duct Construction Standards. Size of ductwork shown on the drawings is free net area, outside dimension of ducts will need to be increased if lined duct is used.

Store internally lined ductwork up off of the floor. Protect internally lined to retain any moisture entering ventilator. ductwork from water and dust. "Butter the leading edge of all internal Access: Provide access and service space around and over fans as duct lining with the manufacturer's recommended adhesive. Roof Curbs: Furnish roof curbs to roofing Installer for installation. Install Inspect and repair all damaged lining prior to installation of ductwork.

Maximum Length: For any duct run using flexible ductwork, do not exceed 5' - 0" extended length. Installation shall have smooth full radius Electrical Wiring: Install electrical devices furnished by manufacturer turns down to diffuser.

Installation not permitted above inaccessible ceilings Access Panels

Furnish all access panels required for proper servicing of equipment. Provide access panels for all concealed valves, vents, controls and cleanout doors, and sprinkler devices required by NFPA. Provide frame as required for finish. Furnish panels to General Contractor. Exact locations to be approved by the Architect. Minimum size to be 12" x Field Quality Control 12", units to be 16 gauge steel, locking device shall be screwdriver cam Testing: After installation of ventilators has been completed, test each

# 23 34 23.00 - HVAC Power Ventilators

nstallation of Elexible Ducts

Inline Centrifugal Fans (IF REQUIRED General: Provide inline centrifugal fans of sizes and arrangement as

indicated, and of capacities and having accessories as scheduled. Housing: Aluminum or galvanized steel housing inlet and outlet flanges, and support bracket adaptable to floor, side wall, or ceiling mountina.

as to be out of air stream. Provide factory wiring to disconnect switch located on outside of fan housing Provide NEMA 1 disconnect factory mounted. For single-phase

fractional HP fans use a toggle type disconnect switch. On three-phase integral HP fans use a NEMA 1 safety switch. Wheel: Backward or forward inclined as scheduled, non-overloading statically and dynamically balanced.

Accessories: Provide the following accessories as indicated. fan outlet with quadrant and lock.

Outlet Damper: Provide manual or motorized outlet damper as

notorized, with blade and edge seals. Companion Flanges: Provide matching flanges on inlet and outlet to connect ductwork to fan. Fittings: Provide radius type fittings fabricated of multiple sections with Motor and Fan Guards: Provide guards on inlets and outlets not

Duct Lining: Provide 1" thick, 3-lb density duct liner a minimum of 10

(ten feet) up and down stream of fan.

Speed Control: For direct drive fans, provide variable speed switch with off-on control, and speed control for 100% to 50% of fan air deliverv Manufacturer: Subject to compliance with requirements, provide inline

centrifugal fans of one of the following: Acme

Cook (Loren) Co.

Greenheck. Twin City Fan & Blower

Centrifugal Roof Ventilators (IF REQUIRED) Provide centrifugal roof type, curb mounted, power ventilators of type, size, and capacity as scheduled, and as specified herein.

Type: Centrifugal fan, direct or belt driven as scheduled. Provide aluminum, galvanized steel, or fiberglass weatherproof housings as scheduled. Provide square base to suit roof curb. Provide permanent split-capacitor type motor for direct driven fans; capacitor-start,

Provide the Following Types of Housing Design:

motor in fan housing. Provide thermal overload protection in fan motor. Titus Products Div., Philips Industries, Inc Provide conduit chase within unit for electrical connection. Provide NEMA 1 disconnect factory mounted. For single phase

fractional HP fans use a toggle type disconnect switch. On three phase integral HP fans use a NEMA 1 safety switch. aluminum or brass wire

be tight seal, motorized, with blade and edge seals. oof Curb: Provide factory fabricated roof curb by the same nanufacturer as the equipment. Roof curb to be insulated. Manufacturer: Subject to compliance with requirements, provide

Acme Cook (Loren) Co.

Greenheck.

Twin City Fan & Blower Ceiling Ventilators

Centrifugal Ceiling Exhausters: Provide centrifugal ceiling exhausters. designed for ceiling or wall mounting, of type, size and capacity as

Provide AMCA Certified Ratings Seal. Type: Provide galvanized steel housing lined with acoustical insulation, adaptable for ceiling or wall installation. Provide centrifugal fan wheels

mounted on motor shaft with fan shrouds, all removable for service. Provide integral backdraft damper fan discharge. Grille: Provide steel louvered grille with flange on intake with General: Assemble and install ductwork in accordance with recognized thumbscrew attachment to fan housing. industry practices which will achieve air-tight (5% leakage for systems Motor: Provide permanent split-capacitor motor, permanently

lubricated Accessories: Provide manufacturer's standard roof jack, wall cap, and

accurately at connections, within 1/8" misalignment tolerance and with Duct Lining: Provide 1" thick, 3-lb density duct liner a minimum of 5' (five feet) up and down stream of fan. Manufacturer: Subject to compliance with requirements, provide centrifugal ceiling exhausters of one of the following:

insulation and deck construction. Include 45 deg. cant strips and deck

flanges with offsets to accommodate roof insulation. Weld corners and

Reinforce continuous runs of over 3'-0" length, by inserting welded

stiffeners of heavy gage with flanges as required to provide sufficient

rigidity and strength to withstand maximum lateral forces in addition to

Where gage or height are not indicated, fabricate units of 14-ga metal,

Sloping Roof Decks: For deck slopes of 1/4" per foot and more,

width indicated, but not less than width of support wall assembly.

Insulate units inside structural support wall with rigid glass fiber

Manufacturer: Subject to compliance with requirements, provide

Provide lumber pressure treated with water-borne preservatives for

insulation board of approximately 3-lb. density and 1-1/2" minimum

General: Examine areas and conditions under which power and gravity

roof edge regardless of location indicated on plans, unless a screen

Coordinate ventilator work with work of roofing, walls, and ceilings, as

ventilators are to be installed. Do not proceed with work until

wall or railing is installed per the local building code. See the

Provide access door in duct below ventilator to service damper.

fabricate support units to form level top edge.

Anchor nailer securely to top of metal frame unit.

thickness, except as otherwise indicated.

prefabricated roof curbs of one of the following:

unsatisfactory conditions have been corrected.

architectural plans for coordination

necessary for proper interfacing.

Cook (Loren) Co.

primer paint.

Greenheck

Twin City Fan & Blower

seams to form watertight units.

and nominal height of 14".

"above ground" use

Custom Curb, Inc.

MicroMet

Pate Co.

Shipman.

Thycurb.

Inspection

Installation

Equipment Manufacturer.

shown on the drawing or not) in order to arrive at the intended air flow. General: Provide manufacturer's standard shop-fabricated units,

### according to roofing manufacturer's recommendation and but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagram submittal to Electrical Installer. Verify that electrical wiring installation is in accordance with

specifications

Adjusting and Cleaning

belt drive power ventilator.

Ceiling Air Diffusers

round duct connecti

ser Dampers:

s TRM frame kit

Diffuser Faces:

Diffuser Mountin

plaster frame

Metal-Aire

Tuttle and Bailey.

Register Dampers:

prime finish.

Metal-Aire

Warranty

Price

Tuttle and Bailey.

STAGED VOLUME

NRCA Standards.

lubricated bearings.

be completely insulated.

charge of nitrogen.

Safety Controls:

oil pressure switch.

high limit cutout

Heating Types:

Temperature Control:

anti-recycling timing device;

and adjustable blades.

Register and Grille Finishes

37 13.00 - Diffusers, Registers and Louvers

Spare Parts

manufacturer's submittal and installation requirements of Division 26 sections. Ensure that rotation is in direction indicated and intended for proper performance. Do not proceed with centrifugal fan start-up until wiring installation is acceptable to fan Installer.

ventilator to demonstrate proper operation of units at performance requirements specified. When possible, field correct malfunctioning units, then retest to demonstrate compliance. Replace units, wh cannot be satisfactorily corrected.

Cleaning: Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint. General: Furnish to Owner, with receipt, one spare set of belts for each

Square: Square housing, core of square concentric louvers, square or

Surface Mount: Diffuser shall have rolled edge below finished ceiling for surface mounting or diffuser shall be furnished with accessory

Lay-In: Diffuser housing sized to fit between ceiling exposed pension tee bars and rest on top surface of tee bar.

Opposed Blade Dampers: Multiple opposed blade dampers connected to linkage adjustable from face of diffuser with key. Diffuser Acoustic Performance: NC less than or equal to 30

Diffuser Accessories: Plaster Ring: Perimeter ring designed to act as plaster stop and diffuser anchor. fuser Finishes: White Enamel: Semi-gloss white enamel prime finish.

Manufacturer: Subject to compliance with requirements, provide diffusers of one of the following: Anemostat Products Div., Dynamics Corp. of America.

Titus Products Div., Philips Industries, Inc.

Ceiling and Wall Registers & Grilles

Steel Construction: Manufacturer's standard stamped sheet steel frame

Opposed Blade: Adjustable opposed-blade damper assembly, key operated from face of register

Register and Grille Finishes: White Enamel: Semi-gloss white enamel Register and Grille Acoustic Performance: NC less than or equal to 30 Manufacturer: Subject to compliance with requirements, provide diffusers of one of the following:

Anemostat Products Div., Dynamics Corp. of America.

### 3 74 33.00 - Packaged Outdoor Rooftop Units

Warranty on Compressor and Heat Exchanger: Provide written warranty, signed by manufacturer, agreeing to replace/repair, within warranty period, compressors and heat exchangers with inadequate and defective materials and workmanship, including leakage, breakage, improper assembly, or failure to perform as required; provided manufacturer's instructions for handling, installing, protecting, and maintaining units have been adhered to during warranty period. Replacement is limited to component replacement only, and does not include labor for removal and reinstallation.

Warranty Period: 5 years from date of owner acceptance.

General: Rooftop unit shall be factory-assembled and tested, designed for roof or slab installation and, consisting of compressors, condensers, evaporator coils, condenser and evaporator fans, refrigeration and temperature controls, filters, and dampers. Capacities and electrical

characteristics are scheduled. Casing manufacturer's standard casing construction, having corrosion protection coating, and exterior finish. Casings shall have removable panels or access doors for inspection and access to internal parts, a minimum of 1" thick thermal insulation, knockouts for electrical and piping connections, and an exterior condensate drain connection, and

Roof Curbs: Manufacturer's standard construction, insulated and having corrosive protective coating, complete with factory-installed wood nailer and drain nipple. Construction shall be in accordance with

Evaporator Fans: Forward-curved, centrifugal, belt-driven fans with adjustable sheaves; and permanently lubricated motor bearings.

Condenser fans: Propeller-type, direct-driven fans with permanently Coils: Aluminum plate fin and seamless copper tube type. Fins shall have collars drawn, belled and firmly bonded to the tubes by means of

mechanical expansion of the tubes. No soldering or tinning shall be used in the bonding process. Coils shall have a galvanized steel casing. Coils shall be mounted in the coil casing with same end connections accessible for service. Coils shall be removable from the unit through the roof or through the piping enclosure. Coil section shall

formed to manufacturer's standard profiles for coordination with roofing, Phenolic Coating – Finned tube coils shall be protected with a pure phenolic thermosetting resinous coating. Metal preparation to provide a surface profile shall include degreasing and etching or phosphatizing by nmersion. The coating shall be applied in multiple coats by immersion. After each immersion, the coating shall be partially cured in an oven. Following the final immersion and the application of one (1) spray coat, the coating shall be totally cured in an oven.

> The total D.F.T. of the coating shall be approximately 2 mils. D.F.T. varies depending upon fin spacing and the number of tube rows in depth. The coating shall withstand dry heat up to 205 degrees Celsius (400 degress Fahrenheit), and show no sign of attack after 3,000 hours of salt spray test to A.S.T.M. Specification B117. The coating shall be Heresite P-413C baking phenolic with plasticizer or approved equal. Refrigerant cooling coils: have an equalizing type vertical distributor to ensure each coil circuit receives the same amount of refrigerant. Coils shall be proof (450 psig) and leak (300 psig) tested with air pressure under water, then cleaned, dehydrated, and sealed with a holding

> Condensate Pan: Provide IAQ steel, double sloping drain pain. Provide high condensate in primary condensate pan to de-energize unit upon detection of high condensate levels.

Compressors: Serviceable, semi-hermetic, or hermetic compressors with integral vibration isolators, and crankcase heaters, which de-energize during compressor operation. Units shall also have: Lead compressor shall be 2-stage.

low pressure cutout, manual reset;

high pressure cutout, manual reset compressor motor overload protection, manual reset;

adjustable low-ambient lockout:

### Enthalpy Controlled Economizer Control

Provide dual enthalpy economizer control. Provide return and outside air dampers, outside air filter, fully modulating electric control system The power ventilator(s) shall be installed a minimum of 10'-0" from any with dry control, and adjustable mixed-air thermostat. System shall be capable of driving 100% closed for unoccupied mode, minimum outside air position and modulation to 100 percent open outside air capability. Provide automatic changeover through adjustable control device.

Electric heat sections: manufacturer's standard construction electric heat coils, factory-wire for single point wiring connection. Complete Solder bottom joints and up 2" of side joints of duct under roof ventilator with over-current and over-heat protection devices.

Temperature control: factory-installed, demand-oriented solid-state indicated, but in no case less than that recommended by manufacturer. control system above 5 tons shall have minimum of 2 cooling steps and

2 heating steps. Controls shall include solid-state thermostats with dead-band, and sub-base with system and fan switches. Other control features include:

Power Exhaust Fan – Shall be factory installed for units larger than 5 tons. Shall include relief damper section with mist eliminator. Dampers open to relieve positive pressure within the building. Available only with

Provide air filters to fit in filter box, with a Maximum filter face velocity of 500 fpm, of the following type: Disposable Type: Provide 30% efficient disposable type air filters 2" thick, consisting of viscous coated fibers with filtering media encased in fiberboard cell sides having perforated metal grids on each side to provide media support.

Filters Provide 85% efficient filters Provide filters with clean resistance not exceeding 0.10" w.g. at face velocity of 300 fpm, and ASHRAE weight arrestance efficiency of 70-82%, based on final operating resistance of 0.5" w.g. Options:

Low Ambient Control (For units without economizers) - Shall allow compressor operation for cooling down to 0 F outside air temperature. Hail guards protecting the condenser fins. Manufacturers: Subject to compliance with requirements, provide rooftop units of one of the following:

Carrier Air Conditioning, Div of Carrier Corp.

Lennox Industries Inc. Trane; a division of Ingersoll Rand.

Examination

Examine areas and conditions under which rooftop units are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer. Installation

General: Install rooftop units in accordance with manufacturer's installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended

clearances. The rooftop unit(s) shall be installed a minimum of 10'-0" from any roof edge regardless of location indicated on plans, unless a screen wall or railing is installed per the local building code. See the architectural plans for coordination.

Support: Install and secure roof curb to roof structure, in accordance with National Roofing Contractor's Association (NRCA) installation recommendations and shop drawings. Install and secure rooftop units on curbs and coordinate roof penetrations and flashing. Condensate Piping: Provide Type L copper condensate piping with

Electrical Connections: Refer to Electrical Specifications - Electrical Connections for Equipment for final connections to equipment and installation of loose shipped electrical components. Demonstration Start-Up Services:

Provide the services of a factory-authorized service representative to start-up rooftop units, in accordance with manu start-up instructions. Test controls and demonst requirements. Replace damaged or malfunctio eauipment.

Training of Owner's Personnel Provide services of manufacturer's service repr Owner's personnel in operation and maintenan Training shall include start-up and shut-down, preventative maintenance schedule and proce troubleshooting procedures plus procedures f and technical assistance. Review operating an contained in the Operating and Maintenance M Division One.

Schedule training with Owner, provide at least Architect/Engineer.

ufacturer's written	
strate compliance with ning controls and	
-	
resentative to instruct	
servicing and	
dures, and	
d maintenance data	
lanuals specified in	
7-day prior notice to the	
	I



### **EXISTING CONDITION NOTES**

THE CONTRACTOR AND SUB CONTRACTOR SHALL NOT INITIATE ANY WORK UNTIL EXISTING FIELD CONDITIONS ARE PROPERLY VERIFIED. THIS SHALL HOLD TRUE FOR FIRST GENERATION AND SECOND GENERATION SPACES, WHEN DEMOLITION IS REQUIRED. THAT WILL BE PERMITTED TO EXPOSE CONDITIONS. THESE VERIFICATIONS SHALL INCLUDE BUT NOT LIMITED TO: DIMENSIONS BOTH HORIZONTAL AND VERTICAL ELECTRICAL SERVICE/PANELS LOCATION AND VOLTS/PHASE, LOCATION/QTY. OF ROOF MOUNTED HVAC EQUIPMENT, CONFIRM THAT INTERIOR HVAC HUNG UNITS HAVE PROPER SUPPORT CONNECTIONS FOR EXISTING STRUCTURE, FIRE SPRINKLER MAIN RUNS, TOILET ROOM DIMENSIONS, DOOR SWING FOR DOORS TO REMAINED ETC. IF NOT VERIFIED AND DISCOVERED AT A LATER TIME, THE CONTRACTOR SHALL REIMBURSE THE ARCHITECT FOR THE REDESIGN FEE. THIS DOES NOT INCLUDE HIDDEN WORK I.E. PITCH OF SANITARY LINES, ACTUAL CONDITIONS OF EXISTING HVAC EQUIPMENT, STRUCTURAL COLUMNS/BEARING WALLS OR CONDITIONS OF GREASE INTERCEPTORS AND ETC.

### **SCOPE OF WORK**

REUSE EXITING ONE 4.0 TON & ONE 6.0 TON GAS HEAT ROOF TOP UNITS AND PROVIDE ONE NEW 3.0 TON GAS FURNACE SPLIT SYSTEM. REUSE EXITING DUCTWORK AND ACCESSORIES AS MUCH AS POSSIBLE AND PROVIDE NEW DUCTWORK AND NECESSARY ACCESSORIES AS SHOWN IN PLAN.

PROVIDE FIVE NEW EXHAUST FANS AS SHOWN IN PLAN.

COORDINATE WITH GC ANY ADDITIONAL REFRIGERATION WORK REQUIRED AND PLUMBING CONTRACTOR PROVIDING CONDENSATE LINES FOR MECHANICAL EQUIPMENT.

### **GENERAL NOTES**

- CONTRACTORS AND SUB-CONTRACTORS SHALL CAREFULLY REVIEW THE CONSTRUCTION DOCUMENTS INFORMATION REGARDING THE COMPLETE WORK IS DISPERSED THROUGHOUT THE DOCUMENT SET AND CANNOT BE ACCURATELY DETERMINED WITHOUT REFERENCE TO THE COMPLETE DOCUMENT SET.
- CONTRACTOR TO VERIFY THAT ALL EQUIPMENT SHOWN AS EXISTING MATCHES THE DESCRIPTIONS AND SPECIFICATIONS SHOWN ON DRAWINGS AND SCHEDULES. IF DIFFERENT NOTIFY ARCHITECT/ENGINEER BEFORE BIDDING, ORDERING, OR PROCEEDING WITH WORK.
- DRAWINGS/DETAILS ARE TO BE CONSIDERED DIAGRAMMATIC, NOT NECESSARILY SHOWING IN DETAIL OR TO SCALE ALL MINOR ITEMS. UNLESS SPECIFIC DIMENSIONS ARE SHOWN, THE STRUCTURAL ARCHITECTURAL AND SITE CONDITIONS SHALL GOVERN EXACT LOCATIONS. CONTRACTOR SHALL FOLLOW DRAWINGS IN LAYING OUT WORK, AND CHECK/COORDINATE DRAWINGS OF ALL TRADES.
- COORDINATE WITH THE WORK OF OTHERS SECTIONS, EQUIPMENT FURNISHED BY OTHERS REQUIREMENTS OF THE OWNER, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE. PROVIDE DUCT RISES AND DRIPS AS REQUIRED FOR FIELD INSTALLATION AND TRADE COORDINATION. NOTIFY ARCHITECT OF ANY DISCREPANCIES BEFORE STARTING WORK.
- DRAWINGS FOR HVAC WORK ARE DIAGRAMMATIC, SHOWING THE GENERAL LOCATION, TYPE, LAYOUT AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENT. REFER TO MANUFACTURER'S STANDARD INSTALLATION DRAWINGS FOR EQUIPMENT CONNECTIONS AND INSTALLATION REQUIREMENTS. PROVIDE DUCTWORK, CONNECTIONS, ACCESSORIES, OFFSETS, AND MATERIALS NECESSARY FOR A COMPLETE SYSTEM.
- ALL WORK SHALL COMPLY WITH STATE AND LOCAL CODE REQUIREMENTS AS APPROVED AND AMENDED BY THE GOVERNING CITY. PURCHASE ALL PERMITS ASSOCIATED WITH THE WORK. OBTAIN ALL INSPECTIONS REQUIRED BY CODE.
- USE OF COMBUSTIBLE MATERIALS IS NOT ALLOWED IN THE RETURN AIR PLENUM. MATERIALS USED I THE PLENUM SHALL HAVE FLAME SPREAD RATING NOT TO EXCEED 25, AND SMOKE DEVELOPED RATING NOT TO EXCEED 50 WHEN TESTED IN ACCORDANCE WITH ASTM E 84. ALL EXPOSED WIRING IN THE PLENUM SHALL BE PLENUM RATED.
- G.C.TO VERIFY LOCATION OF PERMISSIBLE NEW STRUCTURAL ROOF PENETRATIONS AND ADAPT THE REQUIRED DUCTS ACCORDINGLY. THE OPENINGS MUST BE LOCATED USING A REBAR LOCATOR, TRYING TO LEAVE A TRANSVERSE BAR WITHIN 4" FROM THE OPENING. LOCATE OPENINGS AT MID-DISTANCE BETWEEN THE STEMS OF THE DOUBLE TEE AND LONGITUDINAL REINFORCEMENT SHALL NEVER BE CUT CALL THE ARCHITECT'S OFFICE IN CASE OF UNEXPECTED DIFFICULTIES.
- ALL A/C ROUND EXPOSED DUCTS WILL BE SPIRAL GALVANIZED AND READY FOR PAINTING. ALL DUCTS OVER CEILINGS MAY BE SHEET METAL WITH EXTERNAL INSULATION AND ALL EXPOSED SHEET METAL DUCTS SHALL BE INTERNALLY INSULATED.
- G.C. SHALL COORDINATE WITH LANDLORD APPROVED ROOFING CONTRACTOR TO FLASH AND SEAL ALI ROOF PENETRATIONS TO MAINTAIN ROOFING WARRANTY.
- CONSTRUCTION "AS BUILT" DRAWINGS AND DOCUMENTS SHALL BE PROVIDED TO THE OWNER WITHIN 90 DAYS AFTER THE DATE OF ACCEPTANCE AND PROVIDE COPY TO LL.
- OPERATION MANUALS AND MAINTENANCE MANUALS SHALL BE PROVIDED TO THE BUILDING OWNER.

# NY STATE BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF 2020 NEW YORK STATE WITH ALL AMENDMENTS: BASE CODE IBC 2018 AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

- 1. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
- THE LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS AND CONDUCTING SUCH TESTS WILL FILE DOCUMENTATION AND REPORTS OF TESTS THAT THE SYSTEM COMPLIES WITH THE CONSTRUCTION DOCUMENTS AND APPLICABLE LAWS.

VENTILATION FOR ALL AREA SHALL COMPLY WITH 2020 NYS MECHANICAL CODE (2018 IMC), CHAPTER 4

- TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE INTERNATIONAL 2020 NYS MECHANICAL CODE (2018 IMC): A. VENTILATION SYSTEM BALANCING 2020 NYS MECHANICAL CODE (2018 IMC) - 403.3
- THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
- A. STANDARDS OF HEATING 2020 NYS MECHANICAL CODE (2018 IMC) 309.1 B. DUCT CONSTRUCTION AND INSTALLATION 2020 NYS MECHANICAL CODE (2018 IMC) - 603
- C. AIR INTAKES, EXHAUSTS AND RELIEF 2020 NYS MECHANICAL CODE (2018 IMC) 401.5 D. AIR FILTERS 2020 NYS MECHANICAL CODE (2018 IMC) - 605
- MANUAL AND AUTOMATIC FIRE AND SMOKE CONTROLS FOR AIR DISTRIBUTION SYSTEMS 2020 NYS MECHANICAL CODE (2018 IMC) - 606
- F. GAS FIRED EQUIPMENT -2020 NYS FUEL GAS CODE
- MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
- SMOKE DETECTOR SHALL MEET UL268A.
- STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE AS REQUIRED BY 2020 NYS MECHANICAL CODE (2018 IMC) - 403.
- REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
- THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION 10 SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
- VENTILATION SYSTEM SHALL BE BALANCED TO MAINTAIN THE MINIMUM VENTILATION AIRFLOW RATES 11 AS SHOWN IN VENTILATION REQUIREMENT TABLE. THE SYSTEM SHALL BE BALANCED BY APPROVED METHOD. CONTRACTOR TO SUBMIT THE AIR BALANCE REPORT TO INSPECTOR OF RESPECTIVE BUILDING DEPARTMENT PRIOR TO FINAL INSPECTION.

# **MECHANICAL PLAN NOTES**

- REUSE EXITING ONE 4.0 TON & ONE 6.0 TON GAS HEAT ROOF ONE NEW 3.0 TON GAS FURNACE SPLIT SYSTEM. REUSE ACCESSORIES AS MUCH AS POSSIBLE AND PROVIDE NEW DUC ACCESSORIES AS SHOWN IN PLAN. PROVIDE FLEXIBLE CONN DUCT CONNECTIONS. TRANSITION TO DUCT SIZES SHOWN. AIR DISTRIBUTION DEVICES AS INDICATED ON THE PLAN. SCHEDULE FOR ADDITIONAL REQUIREMENTS.
- FOR SYSTEM OVER 2,000 CFM CHECK FOR DUCT MOUNTED AIR SMOKE DETECTORS AND THAT MEET THE REQUIREMENTS OF U.L. 268A, INTERLOCKED TO SHUTDOWN HVAC UNIT UPON DETECTION OF SMOKE. IF NECESSARY PROVIDE SMOKE DETECTOR WITH AN ANNUNCIATOR, ALARM AND POWER L.E.D.'S FOR VISIBLE AND AUDIBLE ALARM SIGNAL, AND VISIBLE TROUBLE SIGNAL. MOUNT ANNUNCIATOR ON ROOM SIDE OF CEILING.
- ALL DUCTS SHALL BE MINIMUM 26 GAUGE SHEET METAL WITH EXTERNAL DUCT WRAP INSULATION FOR CONCEALED DUCTS AND ALL EXPOSED DUCTS WITH INTERNAL INSULATION. ALL DUCTS TO BE MANUFACTURED AND INSTALLED ACCORDING TO ASHRAE AND SMACNA METAL DUCT CONSTRUCTION STANDARD, LATEST EDITION. ALL MATERIALS WILL CONFORM TO NFPA 90A.
- THERMOSTATS & HUMIDISTAT SHALL BE 7-DAY PROGRAMMABLE TYPE. MOUNT THERMOSTAT 48" A.F.F. COORDINATE LOCATION OF THERMOSTAT / HUMIDISTAT WITH ARCHITECT / OWNER.
- ALL INTERIOR AIR DUCTS WITH INSULATION SHALL HAVE A MINIMUM OF THICKNESS OF 1.5", R-6 INSULATION AND EXTERIOR DUCTS SHALL HAVE R-8 INSULATION AS PER 2020 NYS ENERGY CONSERVATION CODE (2018 IECC).
- ALL SEAMS, JOINTS, ETC WILL BE SEALED TO MAKE AIR DUCT AIRTIGHT. PRESSURE SENSITIVE MATERIALS AND OTHERS APPROVED BY LATEST SMACNA. SEALING MATERIALS WILL BE USED.
- ALL EQUIPMENT AND MATERIALS WILL BE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AND ACCORDING TO THE BEST PRACTICE.
- ALL HVAC UNIT CONDENSATE DRAINS WILL BE PVC FULL DIAMETER OF OUTLET AND WILL TERMINATE IN THE NEAREST APPROVED PLACE OF DISPOSAL. TESTING AND BALANCING SHALL BE DONE IN ACCORDANCE WITH 2020 NYS ENERGY CONSERVATION CODE (2018 IECC), SECTION C408.2.2, BALANCING PROCEDURES SHALL
- BE IN ACCORDANCE WITH THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (N.E.B.B.), THE ASSOCIATED AIR BALANCE COUNCIL (A.A.B.C) NATIONAL STANDARDS OR EQUIVALENT PROCEDURES. HANGER ATTACHMENTS TO THE STEEL STRUCTURE WILL BE RATED POWDER ACTUATED
- FASTENERS, "C" CLAMPS, WELDED STUDS, CLAMP HANGERS, JOIST CLAMPS OR OTHER METHODS RECOMMENDED BY SMACNA'S "METAL AND FLEXIBLE STANDARDS", CHAPTER 4, AND WILL HAVE A MINIMUM SAFETY MARGIN OF 4:1. SUSPENDED FROM TOP CHORD OF JOISTS, NOTHING FROM DECK OR CROSS BRACING.
- ALL HVAC CONTROLS AND CONTROL WIRING SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR.
- PROVIDE FIRE/SMOKE +SMOKE COMBINATION DAMPERS WHEREVER REQUIRED.COORDINATE WITH ARCHITECTURAL DRAWINGS FOR SMOKE/FIRE RATING OF THE WALLS/SLABS/ROOF.COORDINATE ELECTRICAL POWER REQUIREMENT FOR DAMPER ACTUATORS WITH ELECTRICAL CONTRACTOR.

# **MECHANICAL SYMBOLS**



# **HVAC PIPING INSULATION NOTES**

- ALL INSULATION MATERIALS, INCLUDING JACKETS, FACING, ADHESIVE, COATINGS, AND ACCESSORIES ARE TO BE FIRE HAZARD RATED AND LISTED BY UNDERWRITERS LABORATORIES, INC. USING STEINER TUNNEL TEST METHOD FOR FIRE HAZARD CLASSIFICATION OF BUILDING MATERIALS, STANDARD UL 723 (ASTM E-84), (ASA A2.5-1963). FLAMESPREAD: MAXIMUM 25. FUEL CONTRIBUTED AND SMOKE DEVELOPED: MAXIMUM 50. FLAMEPROOFING TREATMENTS SUBJECT TO DETERIORATION FROM MOISTURE OR HUMIDITY ARE NOT ACCEPTABLE.
- EXPOSED: INDOOR DUCTS, PIPING OR EQUIPMENT LOCATED IN MECHANICAL EQUIPMENT ROOMS AND IN AREAS WHICH WILL BE VISIBLE WITHOUT REMOVING CEILINGS OR OPENING ACCESS PANELS.
- CONCEALED: INDOOR DUCTS, PIPING OR EQUIPMENT WHICH IS NOT EXPOSED.
- OUTDOOR: DUCTS, PIPING OR EQUIPMENT WHICH IS EXPOSED TO THE WEATHER. MINIMUM REFRIGERANT PIPE INSULATION THICKNESS (IN )

FLUID OPERATING	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (IN.)				
TEMP. RANGE & USAGE (°F)	CONDUCTIVITY BTU.IN./(H.FT <sup>2</sup> .°F)	MEAN RATING TEMP., °F	<1	1 TO<1-1/2	1-1/2 TO <4	4 TO <8	≥8
105 — 140	0.21 — 0.28	100	1.0	1.0	1.5	1.5	1.5
40 — 60	0.21 — 0.27	75	0.5	0.5	1.0	1.0	1.0
< 40	0.20 — 0.26	50	0.5	1.0	1.0	1.0	1.5

TOP UNITS AND PROVIDE	
EXITING DUCTWORK AND	
CTWORK AND NECESSARY	
NECTORS ON SUPPLY AIR	
PROVIDE DUCTWORK AND	
REFER TO MECHANICAL	

EXHAUST FAN WITH LIGHT

OPPOSED BLADE DAMPER

**PROGRAMMABLE THERMOSTAT** REMOTE SENSOR

TEMPERATURE SENSOF ROUND DUCT DIAMETER

CUBIC FEET/ MINUTE

RETURN AIR

SUPPLY GRILLE

CONDENSATE PIPING

BACK DRAFT DAMPER

GENERAL CONTRACTOR

RETURN DIFFUSER

REFER TO DIFFUSER SCHEDULE FOR SPECIFICATIONS

NOTE: THIS PROJECT MAY NOT USE EVERY SYMBOL OR DEVICE APPEARING ON THIS LEGEND

MECHANICAL UNIT SCHEDULE			
UNIT TAG	DU-1(N)	RTU-1(E)	RTU-2(E)
UNIT TYPE	GAS HEAT	GAS HEAT	GAS HEAT
MANUFACTURER	CAPTIVEAIRE	TRANE	TRANE
MODEL	CASRTU3-I.400-15-12.5T	YSC048E3EHA	YSC072E3EHA
STATUS	NEW	EXISTING	EXISTING
LOCATION	ROOF	ROOF	ROOF
TOTAL CAPACITY	12.5 TONS	4.0 TONS	6.0 TONS
TOTAL COOLING MBH	154.0	S.A.E	S.A.E
TOTAL SENSIBLE MBH	57.8	S.A.E	S.A.E
EER	-	S.A.E	S.A.E
IEER	21.3	S.A.E	S.A.E
ISMRE	4.1	-	-
HEATING MBH (INPUT)	395.0	130.0/91.0 (V.I.F)	150.0/105.0 (V.I.F)
HEATING MBH (OUT.)	320.0	105.0/73.7 (V.I.F)	120.0/84.0 (V.I.F)
THERMAL EFF (%)	81.0	S.A.E	S.A.E
SUPPLY AIR (CFM)	2800	1600	2400
OUTDOOR AIR (CFM)	2800	400	600
VOLTAGE/PHASE/HZ	230/3/60	208-230/3/60 (V.I.F)	208-230/3/60 (V.I.F)
MCA (A)	55.1	26.0 (V.I.F)	35.0 (V.I.F)
MOCP (A)	60.0	35.0 (V.I.F)	50.0 (V.I.F)
ESP (IN. OF H2O)	0.75	S.A.E	S.A.E
WEIGHT (lbs)	2500	S.A.E	S.A.E

NOTES FOR DOAS-1(N)

INVERTER SCROLL COMPRESSOR WITH INTEGRATED OIL SENSOR. DIGITAL OR STAGED SCROLL NOT AN APPROVED EQUAL.

DIRECT DRIVE PLENUM BLOWER. BELT DRIVEN BLOWERS ARE NOT ACCEPTABLE. INTEGRATED MONITORING VIA CELLULAR CONNECTION BY MANUFACTURER

REFRIGERATION PRESSURE MONITORING ON HIGH AND LOW PRESSURE SIDE OF SYSTEM INCLUDED THROUGH DIGITAL INTERFACE.

EC MOTOR CONDENSING FANS. ELECTRONIC EXPANSION VALVE. TXV NOT ACCEPTABLE.

SUCTION LINE ACCUMULATOR. FACTORY COMMISSIONING WITH 5 YEAR PARTS WARRANTY, 25 YEAR WARRANTY ON STAINLESS

STEEL HEAT EXCHANGER. AVERAGING INTAKE, EVAP AND DISCHARGE TEMPERATURE SENSORS (DISCHARGE SENSOR TO

BE FACTORY MOUNTED WITHIN UNIT) 0. 2" EXTERIOR DUAL-WALL CONSTRUCTION W/ R-13 INSULATION-MINIMUM 20GA EXTERIOR W/ 14GA BASE

- 1. 81% EFFICIENT FURNACE, WITH MODULATING INDUCER TO MAINTAIN CONSTANT COMBUSTION EFFICIENCY ACROSS FIRING RANGE. 15:1 TURNDOWN WITH NG AND 12:1 TURNDOWN WITH LP. 2. SUPPLY CFM MONITORING INTEGRAL TO UNIT WITH CFM MEASUREMENT INCLUDED THROUGH
- DIGITAL INTERFACE. 13. FULLY MODULATING HOT GAS REHEAT.
- 14. E-COATED CONDENSING COIL.
- 15. E-COATED EVAPORATIVE COIL. 16. E-COATED REHEAT COIL.

17. SIDE DISCHARGE/NO RETURN.

NOTES FOR RTU-1(N) & RTU-2(N)

EXISTING RTUS WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED. S.A.E : SAME AS EXISTING. V.I.F : VERIFY IN FIELD

CONTRACTOR TO FIELD VERIFY IF EXISTING RTUS ARE WORKING AT THEIR 100% RATED CAPACITIES/LOADS. INFORM TO DESIGN ENGINEER IF ANY DISCREPANCIES ARE FOUND IN PERFORMANCE PRIOR TO CONSTRUCTION.

CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF UNIT ON SITE. IF REQUIRED, PROVIDE NEW THERMOSTAT AND TEMPERATURE SENSOR COMPATIBLE WITH EXISTING RTUS. CO-ORDINATE FINAL LOCATION OF T-SENSOR WITH ARCHITECT/OWNER.

CONTRACTOR TO BALANCE OUTSIDE AIR & RETURN AIR DAMPERS ON EXISTING RTUS TO MATCH VALUES MENTIONED IN ABOVE TABLE.

REPLACE FILTERS, IF REQUIRED.

CONTRACTOR SHALL VERIFY EXACT ELECTRICAL CONNECTIONS, WIRE SIZES, BREAKERS, DISCONNECT ETC. PRIOR TO ORDERING AND BID.

FAN SCHEDULE							
DESIGNATION	PEF-1(N)	PEF-2(N)	EF-1(N)	EF-2(N)	EF-3(N)	EF-4(N)	EF-5(N)
STATUS	NEW	NEW	NEW	NEW	NEW	NEW	NEW
QUANTITY	1	1	1	1	1	1	1
MANUFACTURER	CAPTIVEAIRE	CAPTIVEAIRE	GREENHECK	GREENHECK	GREENHECK	GREENHECK	GREENHECK
MODEL	DU85HFA	DU85HFA	SP-A90	CSP-A250	CSP-A250	CSP-A390	SP-A90
CFM	1470 CFM AT 0.75" W.G. ESP	1470 CFM AT 0.75" W.G. ESP	70 CFM AT 0.3" W.G. ESP	210 CFM AT 0.3" W.G. ESP	210 CFM AT 0.3" W.G. ESP	250 CFM AT 0.7" W.G. ESP	70 CFM AT 0.3" W.G. ESP
NEC FLA (AMPS)	8.9	8.9	0.17	0.56	0.56	1.42	0.17
ACCESSORIES	-	-	BDD, LITE KIT	BDD, LITE KIT	BDD, LITE KIT	BDD, LITE KIT	BDD, LITE KIT
WEIGHT (LBS)	130	130	15	25	25	25	15
V/PH/Hz	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60

ECM WIRING PACKAGE - EXHAUST - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL -MSC-(TELCO), CCW ROTATION. SCR-15 BIRD SCREEN.

3. I 19-BDD DAMPER.

6. INTERCONNECT WITH DU-1(N).

PROVIDE BACK DRAFT DAMPER.

PROVIDE MANUAL SWITCH FOR EF-4(N).

INTERCONNECT EF-5(N) WITH AHU-1(N).

6. INTERCONNECT EF-1 (N) WITH ROOM LIGHT

# SPLIT (GAS HEAT) SYSTEM SCHEDULE UNIT TAG UNIT TYPE AREA SERVED SUPPLY AIR (CFM) OUTSIDE AIR (CFM) STATIC PRESS. (E.S.P INCH OF W.C.) MANUFACTURER CAPM MODEL NO. WEIGHT, LBS VOLTS/PH/HZ MCA (A) MOCP TOTAL COOLING CAPACITY (MBH) TOTAL SENSIBLE CAPACITY (MBH) HEATING CAPACITY INPUT GAS (MBH) HEATING CAPACITY OUTPUT GAS (MBH) AFUE (%) UNIT TAG AIR HANDLER SERVED CAPACITY REFRIGEBANT TOT. COOLING CAP. (MB COOLING SENS. CAP. (MBH) **COMPRESSOR RLA/LRA** OUTDOOR FAN FLA VOLTS/PH/HZ M.C.A. / MAX. CKT. BRKR. AMPS MANUFACTURER 24SCA5 MODEL SEER

WEIGHT, LBS SPLIT SYSTEM NOTES:-

COORDINATE FINAL LOCATION OF INDOOR AN

ARCHITECT/OWNER/LANDLORD. 2. SUPPLY AIR CFM BASED ON HIGH SPEED.

- 3. REFRIGERANT R410A SHALL BE PROVIDED.
- 4. PROVIDE ALL ASSOCIATED ACCESSORIES. 5. PROVIDE HOT GAS BYPASS
- 6. ALL REFRIGERANT PIPING TO BE SIZED
- RECOMMENDATIONS. 7. CONTRACTOR SHALL PROVIDE A LONG LINE SET FOR R EVENT THAT TOTAL REFRIGERANT LENGTH EXCEEDS THE MANUFACTURER'S
- STANDARD RECOMMENDED LENGTH. 8. PROVIDE DRAIN PAN WITH WATER LEAK DETECTOR 9. VERIFY ALL DATA WITH MANUFACTURER PRIOR TO ORDERING EQUIPMENT.
- 10. PROVIDE CONDENSATE DRAIN PUMP IF REQUIRED. ROUTE CONDENSATE DRAIN FROM AHU-1(N) TO THE APPROVED SPACE OF DISPOSAL. COORDINATE WITH PLUMBING CONTRACTOR.
- 1. PROVIDE GAS FLUE VENTS AND COMBUSTION AIR INTAKES TO AHUS AS PER MANUFACTURER'S INSTRUCTION.

				Ø12"	401-600
		DI	FUSER SCHEDU	ILE	
	MANUFACTURER	TITUS	TITUS	TITUS	TITUS
EF-5(N)	DESIGNATION	A	R	R1	E
NEW	USE	SUPPLY	RETURN	RETURN	EXHAUST
1	MODEL	TDC-AA	TDC-AA	56-FL	56-FL
	MOUNTING	SAT / HARD CEILING	SAT / HARD CEILING	WALL / DUCT	SAT / HARD CEILING
GREENHECK	LOCATION	AS SHOWN	AS SHOWN	AS SHOWN	AS SHOWN
SP-A90	FACE SIZE	24" X 24"	24" X 24"	AS SHOWN	12"X12"
	NECK SIZE	REFER TABLE A	-	-	-
W.G. ESP	FRAME TYPE	LAY IN/FLANGED	LAY IN/FLANGED	FLANGED	LAY IN/FLANGED
0.17	FINISH	BLACK	BLACK	BLACK	BLACK
0.17	NOISE CRITERIA	<30	<30	<30	<30
BDD, LITE KIT	ACCESSORIES	VOLUME DAMPER	VOLUME DAMPER	VOLUME DAMPER	VOLUME DAMPER

	DI	FUSER SCHEDU	JLE	
MANUFACTURER	TITUS	TITUS	TITUS	TITUS
DESIGNATION	A	R	R1	E
USE	SUPPLY	RETURN	RETURN	EXHAUST
MODEL	TDC-AA	TDC-AA	56-FL	56-FL
MOUNTING	SAT / HARD CEILING	SAT / HARD CEILING	WALL / DUCT	SAT / HARD CEILING
LOCATION	AS SHOWN	AS SHOWN	AS SHOWN	AS SHOWN
FACE SIZE	24" X 24"	24" X 24"	AS SHOWN	12"X12"
NECK SIZE	REFER TABLE A	-	-	-
FRAME TYPE	LAY IN/FLANGED	LAY IN/FLANGED	FLANGED	LAY IN/FLANGED
FINISH	BLACK	BLACK	BLACK	BLACK
NOISE CRITERIA	<30	<30	<30	<30
ACCESSORIES	VOLUME DAMPER	VOLUME DAMPER	VOLUME DAMPER	VOLUME DAMPER

NOTES

1. MAX. NC LEVEL 30 OR LESS. 2. PROVIDE SQUARE TO ROUND NECK ADAPTOR.

3. CO-ORDINATE WITH ARCHITECT FOR FINAL MOUNTING, FRAME TYPE, PAINT AND FINISH. 4. PROVIDE 4-WAY AIR THROW PATTERN UNLESS NOTED OR INDICATED.

5. PROVIDE INSULATED BACKS ON ALL DIFFUSERS.

NOTES FOR PEF-1(N) & PEF-2(N)

4. MSC TO BE SET UP FOR CONTROL TYPE: 0-10V - TELCO

5. 2 YEAR PARTS WARRANTY.

NOTES FOR OTHER FANS :

PROVIDE DISCONNECT SWITCH

INTERCONNECT EF-2(N) & EF-3(N) WITH RTU-1(E).

CHEDULE	
AHU-1(N)	1
GAS HEAT	
REFER PLAN	
1200	
100	
0.5	
CARRIER	
IP3617ACA/ 59SC <mark>5B0</mark> 60E17	
(OR EQUIVALENT)	
220	
115/1/60	
12.9	
15	
31.4	
24.0	
60	
58	
96.5	
ACCU-1 (N)	
AHU-1(N)	
3.0 TR	
R410A	
31.4	
24.0	
12.2/80.1	
1.4	
208-230/1/60	
16.7/25.0	
CARRIER	
536WC03 (OR EQUIVALENT)	
15	
170	
ND OUTDOOR UNIT WITH	1
	1

OCCUPANCY CA COD	LCULATION PER 2020 NYS MECH E (2018 IMC), TABLE 403.3.1.1	ANICAL	
RECEPTION AREA 295 S	Q. FT. CLASS SIZE LIMITS BY HOUSE RULES	6 PEOPLE	
VIEWING AREA 1038 S	Q. FT. CLASS SIZE LIMITS BY HOUSE RULES	97 PEOPLE	
STAFE AREA 430 S	Q. FT. 5 PEOPLE PEB 1000 SQ.FT.	3 PEOPLE	
	TOTAL		
REFER TO THE OCC ARCHITECTURAL OCCUP	UPANT LOAD CALCULATIONS ON SHEET ANCY CALCULATION.	CS-1 FOR	
VENTILATION REC	QUIREMENTS PER 2020 NYS MECI E (2018 IMC), TABLE 403.3.1.1	HANICAL	
RECEPTION AREA	295 SQ. FT. X 0.06 CFM/SQ. FT. =	18 CFM	
	6 PEOPLE. X 5 CFM/PEOPLE. =	30 CFM	
VIEWING AREA	1038 SQ. FT. X 0.06 CFM/SQ. FT. =	62 CFM	
	97 PEOPLE. X 7.5 CFM/PEOPLE. =	728 CFM	
_OBBY/RECEPTION	166 SQ. FT. X 0.06 CFM/SQ. FT. =	10 CFM	
	5 PEOPLE. X 5 CFM/PEOPLE. =	25 CFM	
STAFF AREA	430 SQ. FT. X 0.06 CFM/SQ. FT. =	26 CFM	
VESTIBULE	80 SQ. FT. X 0.06 CFM/SQ. FT. =	5 CFM	
STORAGE	323 SQ. FT. X 0.12 CFM/SQ. FT. =	39 CFM	
OUTSIDE AIR REQUIRED		958 CFM	
MEN'S RESTROOM	70 CFM PER FIXTURE	210 CFM	
WOMEN'S RESTROOM	70 CFM PER FIXTURE	210 CFM	
POOL RESTROOM	70 CFM PER FIXTURE	70 CFM	
FF CHANGING AREA	806 SQ. FT. X 0.25 CFM/SQ.FT =	202 CFM	
SF CHANGING	40 SQ. FT. X 0.25 CFM/SQ.FT =	10 CFM	
EXHAUST AIR REQUIRED		702 CFM	
AIR BALANCE			
	ΓU-1(E)	400 CFM	
	ΓU-2(E)	600 CFM	
	1U-1 (N)	100 CFM	
EF-1(N) EE 2(N) 8 EE 2(N) @210 CE		-70 CFM	
LI -2(IN) & EF-3(IN) @210 CF EF-4(NI)			
⊑i -+(i¥) EF-5(N)			
1. CONTRACTOR TO ADJUST MOTORIZED/MANUAL DAMPER ON FRESH AIR TAP TO PROVIDE OUTSIDE AIR AS MENTIONED IN ABOVE TABLE			

PER	MANUFACTURERS
REFRIGEI	RANT PIPING IN THE

NECK SIZE TABLE - A				
IECK SIZE DIA	CFM RANGE			
Ø6"	0-100			
Ø8"	101-200			
Ø10"	201-400			
Ø12"	401-600			





# THERMOSTATIC CONTROLS

### C403.4.1 THERMOSTATIC CONTROLS (MANDATORY)

THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, NOT FEWER THAN ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM. EXCEPTION: INDEPENDENT PERIMETER SYSTEMS THAT ARE DESIGNED TO OFFSET ONLY BUILDING ENVELOPE HEAT LOSSES, GAINS OR BOTH SERVING ONE OR MORE PERIMETER ZONES ALSO SERVED BY AN INTERIOR SYSTEM PROVIDED THAT BOTH OF THE FOLLOWING CONDITIONS ARE MET:

- THE PERIMETER SYSTEM INCLUDES NOT FEWER THAN ONE THERMOSTATIC CONTROL ZONE FOR EACH BUILDING EXPOSURE HAVING EXTERIOR WALLS FACING ONLY ONE ORIENTATION
- (WITHIN ± 45 DEGREES) (0.8 RAD) FOR MORE THAN 50 CONTIGUOUS FEET (15 240 MM).
  2. THE PERIMETER SYSTEM HEATING AND COOLING SUPPLY IS CONTROLLED BY THERMOSTATS
- LOCATED WITHIN THE ZONES SERVED BY THE SYSTEM.
- C403.4.1.2 DEADBAND (MANDATORY)

WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CONFIGURED TO PROVIDE A TEMPERATURE RANGE OR DEADBAND OF NOT LESS THAN 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS SHUT OFF OR REDUCED TO A MINIMUM.

# EXCEPTIONS:

- 1. THERMOSTATS REQUIRING MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.
- 2. OCCUPANCIES OR APPLICATIONS REQUIRING PRECISION IN INDOOR TEMPERATURE CONTROL AS APPROVED BY THE CODE OFFICIAL.
- C403.4.1.3 SETPOINT OVERLAP RESTRICTION (MANDATORY)

WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, A LIMIT SWITCH, MECHANICAL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE CONFIGURED TO PREVENT THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION C403.4.1.2.

C403.4.2 OFF-HOUR CONTROLS (MANDATORY)

EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM. EXCEPTIONS:

1. ZONES THAT WILL BE OPERATED CONTINUOUSLY.

2. ZONES WITH A FULL HVAC LOAD DEMAND NOT EXCEEDING 6,800 BTU/H (2 KW) AND HAVING A MANUAL SHUTOFF SWITCH LOCATED WITH READY ACCESS.

C403.4.2.1 THERMOSTATIC SETBACK (MANDATORY)

THERMOSTATIC SETBACK CONTROLS SHALL BE CONFIGURED TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C).

C403.4.2.2 AUTOMATIC SETBACK AND SHUTDOWN (MANDATORY)

AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR NOT FEWER THAN 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS; A MANUALLY OPERATED TIMER CONFIGURED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR. C403.4.2.3 AUTOMATIC START (MANDATORY)

AUTOMATIC START CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM. THE CONTROLS SHALL BE CONFIGURED TO AUTOMATICALLY ADJUST THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY.





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![](_page_5_Figure_0.jpeg)

![](_page_6_Figure_0.jpeg)

### **ELECTRICAL PLAN NOTES**

#### 1 GENERAL REQUIREMENTS

THE GENERAL PROVISIONS OF THE CONTRACT INCLUDING ANY GENERAL AND SUPPLEMENTAL CONDITIONS AND GENERAL REOUIREMENTS

APPLY TO THE WORK IN THIS SECTION BEFORE SUBMITTING A BID, EXAMINE ALL MECHANICAL, ARCHITECTURAL, AND/OR STRUCTURAL DOCUMENTS, VISIT THE SITE AND GET ACQUAINTED WITH ALL CONDITIONS THAT MAY IN ANY WAY WHATSOEVER AFFECT THE EXECUTION OF THIS CONTRACT TAKE MEASUREMENTS AND BE RESPONSIBLE FOR EXACT SIZE AND LOCATIONS OF ALL OPENINGS REQUIRED FOR THE INSTALLATION OF WORK FIGURED DIMENSIONS ARE REASONABLY ACCURATE AND SHOULD GOVERN IN SETTING OUTWORK WHERE DETAILED METHOD OF INSTALLATION IS NOT INDICATED OR WHERE VARIATIONS EXIST BETWEEN DESCRIBED WORK AND APPROVED PRACTICE, DIRECTION OF THE OWNER'S REPRESENTATIVE ON JOB SITE SHALL BE FOLLOWED.

THE CONTRACT INCLUDES ALL ITEMS OF MATERIAL AND LABOR REQUIRED FOR THE COMPLETE INSTALLATION AND FULL OPERATION OF THE ELECTRICAL WORK AS SHOWN ON THE DRAWINGS AND HEREINAFTER SPECIFIED ALL WORK, MATERIALS, AND EQUIPMENT SHALL HAVE A ONE YEAR WARRANTY AFTER ACCEPTANCE OF THE WORK BY THE OWNER ANY DEFECTIVE ITEMS SHALL BE REMOVED AND REPLACED AT THE ELECTRICAL SUB-CONTRACTOR'S EXPENSE AND TO THE SATISFACTION OF THE ENGINEER

PERFORM WORK UNDER THIS CONTRACT IN CLOSE HARMONY WITH OTHER CONTRACTORS SO COMPLETED WORK SHALL PRESENT A NEAT AND WORKMANLIKE INSTALLATION EXPOSED FINISHED MATERIALS AND EQUIPMENT SHALL BE CAREFULLY CLEANED AND WIPED TO REMOVE GREASE, SMUDGES, DUST AND OTHER SPOTS AND LEFT SMOOTH AND CLEAN DURING THE PROGRESS OF THE WORK, THE ELECTRICAL SUB-CONTRACTOR SHALL CAREFULLY CLEAN UP AFTER HIS MEN AND SHALL .EAVE THE PREMISES AND ALL PORTIONS OF THE BUILDING IN WHICH HE IS WORKING FREE OF DEBRIS AND IN A CLEANN AND SAFE CONDITION.

TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR EQUIPMENT CONNECTORS WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT INDICATED, TIGHTEN CONNECTORS AND TERMINALS TO COMPLY WITH TIGHTENING TORQUES SPECIFIED IN APPLICABLE UL AND NEC STANDARDS.

WHENEVER THE WORDS "CONTRACTOR", "THIS CONTRACTOR", ETC APPEAR ON DRAWINGS OR IN THESE SPECIFICATIONS FOR THE ELECTRICAL WORK, IT SHALL REFER TO THE ELECTRICAL SUB-CONTRACTOR", ETC APPEAR ON DRAWINGS OR IN THESE SPECIFICATIONS FOR THE ELECTRICAL WORK, IT SHALL REFER TO THE ELECTRICAL SUB-CONTRACTOR", ETC APPEAR ON DRAWINGS OR IN THESE SPECIFICATIONS FOR THE ELECTRICAL WORK, IT SHALL REFER TO THE ELECTRICAL SUB-CONTRACTOR", ETC APPEAR ON DRAWINGS OR IN THESE SPECIFICATIONS FOR THE ELECTRICAL WORK, IT SHALL REFER TO THE ELECTRICAL SUB-CONTRACTOR", ETC APPEAR ON DRAWINGS OR IN THESE SPECIFICATIONS FOR THE ELECTRICAL WORK, IT SHALL REFER TO THE ELECTRICAL SUB-CONTRACTOR", ETC APPEAR ON DRAWINGS OR IN THESE SPECIFICATIONS FOR THE ELECTRICAL WORK, IT SHALL REFER TO THE ELECTRICAL SUB-CONTRACTOR WHENEVER THE WORD "PROVIDE". APPEARS IN THESE DOCUMENTS, IT SHALL BE INTERPRETED TO MEAN "FURNISH & INSTALL".

OUTLET MOUNTING HEIGHTS AS INDICATED ON THE PLANS ARE APPROXIMATE TO BE USED FOR BIDDING PURPOSES ONLY THE EXACT MOUNTING HEIGHT OF OUTLETS SHALL BE DETERMINED IN THE FIELD WITH RELATION TO ARCHITECTURAL DETAILS AND EQUIPMENT BEING SERVED IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO COORDINATE OUTLET LOCATION WITH EQUIPMENT THE OWNER'S REPRESENTATIVE SHALL BE PERMITTED TO RELOCATE ANY OUTLET PRIOR TO INSTALLATION WITHIN A 15 FOOT LIMIT AT NO ADDITIONAL CHARGE IN CONTRACT PRICE ALL FASTENERS, HANGERS AND METHODS OF HANGING EXPOSED WORK IN FINISHED AREAS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL BEFORE INSTALLATION IF DURING CONSTRUCTION IF BECOMES APPARENT THAT CERTAIN MINOR CHANGES IN LAYOUT WILL EFFECT NEATER JOB OR BETTER ARRANGEMENT, SUCH ALTERATIONS SHALL BE MADE AS PART OF THE CONTRACT ENGINEER'S APPROVAL SHALL BE OBTAINED BEFORE MAKING SUCH CHANGES WORKMANSHIP THROUGHOUT SHALL CONFORM TO THE STANDARDS OF BEST PRACTICE MARKS, DENTS OR FINISH SCRATCHES WILL NOT BE PERMITTED ON ANY EXPOSED MATERIALS, FIXTURES OR FITTINGS INSIDE OF PANELS & EQUIPMENT BOXES SHALL BE LEFT CLEAN. THE SYSTEM SHALL RING ENTIRELY FREE FROM GROUND WHEN TESTED OUT IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER INSTRUCTION OF EACH SYSTEM TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE UPON COMPLETION OF THE JOB, THIS CONTRACTOR SHALL FURNISH THE OWNER WITH A COMPLETE SET OF OPERATING INSTRUCTIONS ON ALL ELECTRICAL SYSTEMS INSTALLED.

#### THE ELECTRICAL CONTRACTOR SHALL CONSULT THE PLANS OF ALL OTHER TRADES IN ALL INSTANCES BEFORE INSTALLING HIS WORK SO THAT HIS PIPING WILL NOT INTERFERE WITH THOSE BRANCHES IN THE EVENT OF A CONFLICT, THIS CONTRACTOR

SHALL REPORT TO THE OWNER' REPRESENTATIVE AT ONCE AND DO NO FURTHER WORK TO BE INSTALLED UNTIL A SATISFACTORY ARRANGEMENT IS DECIDED UPON ANY WOR DONE OR EQUIPMENT PLACED IN POSITION BY THIS CONTRACTOR, CREATING A CONFLICT IN VIOLATION HEREOF, SHALL BE READJUSTED TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE AT THE EXPENSE OF THE CONTRACTOR THE DECISION OF THE OWNER'S REPRESENTATIVE SHALL BE FINAL IN REGARD TO CHANGES DUE TO CONFLICTING CONDITIONS.

#### 2 SHOP DRAWINGS

THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS ONLY FOR ITEMS OF MATERIAL AND EQUIPMENT DIFFERENT THEN THOSE ALREADY CALLED FOR WITHIN THESE DRAWINGS FOR APPROVAL BY THE ENGINEER THE CONTRACTOR IS NOT AUTHORIZED TO PURCHASE ANY MATERIAL UNTIL SUCH APPROVAL IS OBTAINED A MINIMUM OF SIX SEPARATE SETS OF DRAWINGS IS REQUIRED AND WILL 6E DISTRIBUTED AS FOLLOWS: 1 COPY FOR ENGINEER'S FILE; 1 COPY FOR ARCHITECT'S FILE; 2 COPIES FOR THE OWNER'S FILE; 2 COPIES FOR THE CONTRACTOR SHOP DRAWINGS SHALL BE NEATLY BOUND IN A FLAT RING BINDER HAVING JOB NAME AND CONTRACTOR'S NAME ON COVER A SINGLE SUBMISSION IS PREFERRED HAVING ALL ITEMS INCLUDED LOOSE SHEET OR INCOMPLETE SUBMITTALS WILL NOT BE ACCEPTED ALL ITEMS OF MATERIAL TO BE SUPPLIED WHICH DO NOT REQUIRE SHOP DRAWING SUBMISSION SUCH AS CONDUIT, WIRE, BOXES, ETC , SHALL BE LISTED AS SEPARATE MATERIAL SHOWING

MANUFACTURER'S NAME AND CATALOG NUMBER AND TYPE AND SHALL BE INCLUDED WITH SHOP DRAWINGS SUBMITTAL

3 RECORD DRAWINGS AND OPERATING INSTRUCTIONS & SERVICE MANUAL

TWO SETS OF MECHANICAL/ELECTRICAL DRAWINGS SHALL BE PROVIDED AS RECORD DRAWINGS WHICH SHALL BE SEPARATE, CLEAN, SEPIA REPRODUCIBLES RESERVED FOR THE PURPOSE OF SHOWING A COMPLETE PICTURE OF THE WORK AS ACTUALLY INSTALLED THESE DRAWING SHALL ALSO SERVE AS WORK PROGRESS REPORT SHEETS AND THE ELECTRICAL SUB-CONTRACTOR SHALL MAKE ANY NOTATIONS, NEAT AND LEGIBLE THEREON DAILY AS WORK PROCEEDS THE DRAWINGS SHALL BE AVAILABLE FOR INSPECTION AT ALL TIMES AND SHALL BE KEPT AT THE JOB AT A LOCATION DESIGNATED BY THE OWNER'S REPRESENTATIVE AT THE COMPLETION OF THE WORK, THESE RECORD DRAWINGS SHALL BE SIGNED BY THE ELECTRICAL SUB-CONTRACTOR, DATED AND RETURNED TO THE OWNER'S REPRESENTATIVE FINAL PAYMENT OF CONTRACT WILL NOT BE MADE UNTIL RECEIPT AND REVIEW OF SAID DRAWINGS PROVIDE TWO NEATLY BOUND (WITH TABBED SECTIONS) COPIES OF MAINTENANCE AND INSTRUCTION BOOKS, PARTS LIST PERTAINING TO ALL EQUIPMENT FURNISHED SUBMIT TO THE OWNER'S REPRESENTATIVE FOR APPROVAL FINAL PAYMENT WILL NOT BE MADE UNTIL DRAWINGS FOR RECORD, MAINTENANCE AND INSTRUCTION MANUALS ARE DELIVERED TO THE OWNER'S REPRESENTATIVE

#### 4 PERMITS AND REGULATIONS

THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE SHALL BE THE MINIMUM REQUIREMENT FOR ALL WORK CONTRACTOR SHALL PAY PARTICULAR ATTENTION TO REQUIREMENTS OF NEC ARTICLE 680, PERTAINING TO POOLS AND POOL EQUIPMENT IN ADDITION TO ALL OTHER NEC REQUIREMENTS. ALL ELECTRICAL MATERIALS USED IN THIS WORK AND ALL WORKMANSHIP AND TESTS PERFORMED THEREIN. UNLESS SPECIFICALLY SPECIFIED SHALL CONFORM TO THE LATEST RULES AND REGULATIONS AND SPECIFICATIONS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS. LOCAL AND STATE CODES AND AUTHORITIES HAVING JURISDICTION AND UTILITY COMPANY. EXAMINE THE DRAWINGS AND SPECIFICATIONS FOR COMPLIANCE WITH PREVAILING CODES, REGULATIONS AND ORDINANCES AND BASE BID AND WORK ACCORDINGLY, ANY MINOR DISCREPANCY BETWEEN THESE DRAWINGS/SPECIFICATIONS AND CODES, LAWS, ORDINANCES, RULES AND REGULATIONS SHALL BE CORRECTED BY THIS CONTRACTOR AS REQUIRED WITHOUT ANY ADDITIONAL REIMBURSEMENT. MAJOR DISCREPANCIES SHALL INMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER (IN

WRITING), PRIOR TO INSTALLATION ALONG WITH THE CONTRACTOR'S PROPOSED COST FOR CORRECTION THIS CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS OR CERTIFICATES OF INSPECTION AND APPROVAL REQUIRED FOR THIS BRANCH OF THE WORK OWNER SHALL BE FURNISHED WITH CERTIFICATES OF FINAL INSPECTION AND APPROVAL PRIOR TO FINAL ACCEPTANCE OF THIS BRANCH OF THE WORK. 5 DRAWINGS AND SPECIFICATIONS THE SPECIFICATIONS AND ACCOMPANYING DRAWINGS ARE INTENDED TO DESCRIBE THE SCOPE OF ALL ELECTRIC/MECHANICAL WORK. THE DRAWINGS ARE AN OUTLINE TO INDICATE THE APPROXIMATE LOCATION AND ARRANGEMENT OF

WIRING AND EQUIPMENT. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE IN EXECUTING OF THE WORK. SHOULD THERE BE A CONFLICT BETWEEN DRAWINGS AND SPECIFICATIONS, THIS CONTRACTOR SHALL REFER THE MATTER TO THE OWNER'S REPRESENTATIVE FOR A DECISION AS TO METHOD OR MATERIAL. ELECTRICAL CONTRACTOR SHALL REFER TO DRAWINGS OF ALL OTHER TRADES FOR DETAILS, DIMENSIONS AND LOCATIONS OF OTHER WORK AND ROUTE

HIS WORK SO AS NOT TO CONFLICT WITH ANY OTHER BRANCH. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING QUANTITIES OF EQUIPMENT MENTIONED IN THE SPECIFICATIONS WITH THOSE SHOWN ON SHOWNS ON THE DRAWINGS. IF

DISCREPANCIES ARE NOTED, PROVIDE THE GREATER OF THE QUANTITIES OR THE BETTER OF THE QUALITIES AS QUALITIES AS APPLICABLE

#### 6 MATERIALS AND EQUIPMEN

ALL MATERIALS AND EQUIPMENT SHALL BE NEW ALL MATERIALS, APPARATUS AND EQUIPMENT SHALL BEAR THE UNDERWRITER'S LABORATORIES INC , LABEL WHERE REGULARLY SUPPLIED CERTAIN MANUFACTURERS OF MATERIAL AND

#### EQUIPMENT ARE SPECIFIED AND PLANS ARE DETAILED ACCORDING TO THIS MATERIAL THIS CONTRACTOR SHALL BASE HIS BID ON FURNISHING AND INSTALLING THIS MAKE OF MATERIAL AND EQUIPMENT WHERE MORE THAN ONE MAKE OF MATERIAL OR EQUIPMENT IS SPECIFIED, THE CONTRACTOR SHALL STATE IN HIS BID WHICH MAKE HE PROPOSES TO FURNISH.

7 ELECTRICAL IDENTIFICATION

PROVIDE MANUFACTURER'S STANDARD SELF-ADHESIVE VINYL TAPE NOT LESS THAN 3 MILS THICK BY 1-1/2" WIDE WHERE APPLICABLE. INSTALL ON ALL CONCEALED RACEWAYS AT CONNECTION TO ALL JUNCTION BOXES. PULL BOXES.

WALL/FLOOR/, ETC UNLESS OTHERWISE INDICATED OR REQUIRED BY GOVERNING REGULATIONS, PROVIDE ORANGE TAPE WITH BLACK LETTERS.

PROVIDE CIRCUIT IDENTIFICATION BANDS FOR ALL CABLES AND CONDUCTORS PROVIDE MANUFACTURER'S STANDARD COLOR CODING FOR CABLE CONDUCTOR JACKET AND/OR INSULATION FOR ALL CABLES AND CONDUCTORS OF ALL MATCH IDENTIFICATION WITH MARKING SYSTEM USED IN EXISTING SYSTEMS (WHERE APPLICABLE), SHOP DRAWINGS, CONTRACT DOCUMENTS, AND SIMILAR PREVIOUSLY ESTABLISHED IDENTIFICATION FOR PROJECT'S ELECTRICAL WORK PROVIDE ON ALL CONDUCTORS OF ALL SYSTEMS INSTALL ENGRAVED PLASTIC-LAMINATE SIGN ON MAJOR UNITS OF ELECTRICAL EQUIPMENT. INCLUDING CENTRAL OR MASTER UNIT OF EACH ELECTRICAL SYSTEM INCLUDING COMMUNICATION/CONTROL/SIGNAL SYSTEMS. UNLESS UNIT IS SPECIFIED WITH ITS OWN SELF-EXPLANATORY IDENTIFICATION OR SIGNAL SYSTEM EXCEPT AS OTHERWISE INDICATED. PROVIDE SINGLE LINE OF TEXT. 1/2" HIGH LETTERING. ON 1-1/2" HIGH SIGN (2" HIGH WHERE 2 LINES ARE REQUIRED). WHITE LETTERING IN BLACK FIELD UNLESS DETERMINED OTHERWISE IN FIELD. PROVIDE TEXT MATCHING TERMINOLOGY AND NUMBERING OF THE CONTRACT DOCUMENTS AND SHOP DRAWINGS SECURE TO SUBSTRATE WITH FASTENERS. EXCEPT USE ADHESIVE WHERE FASTENERS SHOULD NOT OR CANNOT PENETRATE SUBSTRATE AS A MINIMUM PROVIDE SIGNS FOR EACH UNIT OF THE FOLLOWING CATEGORIES OF ELECTRICAL WORK WHERE SUCH WORK EXISTS ON THE PROJECT ALL STARTERS AND DISCONNECTS; ALL REMOTE FIXTURE OR EQUIPMENT SWITCHING DEVICES (VIA ENGRAVED WALL PLATES); ALL SYSTEM DEVICES, PORTS, TAPS, J.B.'S, P.B.S, ETC; PANEL BOARDS. ELECTRICAL CABINETS: ANY OTHER EQUIPMENT DESIGNATED BY OWNER OR ENGINEER IN FIELD

ALL EQUIPMENT & SYSTEM IDENTIFICATION NOMENCLATURE SHOWN ON DRAWINGS OR LISTED HEREIN IS SHOWN FOR GENERAL DESIGN AND INSTALLATION REFERENCE ONLY THE ACTUAL NAMEPLATE, ETC NOMENCLATURE FOR THIS PROJECT SHALL BE VERIFIED BY ELECTRICAL CONTRACTOR IN FIELD PRIOR TO FABRICATION AND WHERE APPLICABLE, SHALL BE AN EXTENSION OF EXISTING NOMENCLATURE USED ON THE SITE AS DETERMINED IN FIELD BY ELECTRICAL CONTRACTOR.

# IN ADDITION TO THE ABOVE, ALL LABELING FOR ALL ELECTRICAL WIRING WORK (FOR ALL SYSTEMS) SHALL BE 3M DCI NO 054007-11954 "SWD" WRITE-ON TAPE DISPENSER KIT WITH FACTORY PROVIDED SPECIAL FAST DRYING MARKER INCLUDED

KIT ALL MARKINGS SHALL BE CLEAR AND LEGIBLE. AS DETERMINED IN FIELD, PROVIDE COLOR CODING FOR JUNCTION BOXES, PULL BOXES AND ASSOCIATED PLATES TO MATCH EXISTING BUILDING STANDARDS THE FOLLOWING INSULATION COLOR CODE SHALL BE USED FOR SYSTEM AND VOLTAGE IDENTIFICATION FOR FEEDER AND BRANCH CIRCUIT WIRING.

#### 120/208V SYSTEM - BLACK, RED, BLUE & GRAY (NEUTRAL)

EQUIPMENT GROUNDING - GREEN SYSTEMS - TO MATCH EXISTING - VERIFY IN FIELD

#### B GROUNDING

ALL METALLIC CONDUIT. SURFACE WIREWAYS, SUPPORTS, CABINET AND EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH THE LATEST ISSUE OF THE NATIONAL ELECTRICAL CODE AND AS SHOWN ON PLANS THE GROUND TERMINALS OF

RECEPTACLES SHALL BE CONNECTED TO THE EQUIPMENT GROUND BUS OF THE SOURCE BRANCH CIRCUIT PANELBOARD ALL GROUNDING CONDUCTORS SHALL BE PROTECTED FROM MECHANICAL INJURY ALL CONNECTIONS TO EQUIPMENT OR CONDUIT SHALL BE MADE WITH AN APPROVED CONDUCTOR AND SAME SHALL BE BOLTED OR CLAMPE TO EQUIPMENT AND CONDUIT ALL CONTACT SURFACES SHALL BE THOROUGHLY CLEANED AND BRIGHT BEFORE CONNECTIONS TO INSURE A GOOD METAL CONTACT.

ALL NEW FEEDERS AND BRANCH CIRCUITING INSTALLED UNDER THIS CONTRACT SHALL BE PROVIDED WITH EQUIPMENT GROUNDING CONDUCTORS SIZED AND INSTALLED IN ACCORDANCE WITH LATEST ISSUE OF THE NATIONAL ELECTRICAL CODE ARTICLE 250 AND AS GROUNDING PER NEC ARTICLE 680 TO BE PROVIDED BY THIS CONTRACTOR

### 9 CONDUIT AND FITTINGS

ALL WIRING FOR DIFFERENT POWER VOLTAGES SHALL BE INSTALLED IN RACEWAY SYSTEMS SEPARATE FROM EACH OTHER (I.E. 24V SEPARATE FROM 120/208V). ONLY VOICE AND DATA CABLES MAY SHARE RACEWAYS

# ALL WIRING SHALL BE RUN IN CONDUIT. THIN WALL EMT CONDUIT SHALL BE USED, SIZES 1/2 " (MINIMUM) THROUGH 2-1/2" ALL CONDUITS LARGER THAN 2-1/2" SHALL BE HEAVY WALL. CONDUITS INSTALLED UNDERGROUND OR IN CONCRETE

SLABS SHALL BE PVC JACKETED FLEXIBLE STEEL CONDUIT. SEALTITE SHALL BE USED IN WET AREAS AND ON ALL MOTORIZED EQUIPMENT. FLEXIBLE CONDUIT MAY ONLY BE USED FOR FINAL CONNECTIONS. NO BX, ROMEX, ARMORED CABLE, ETC SHALL BE ALLOWED ALL VISIBLE CONDUIT SHALL BE RIGID ALL FITTINGS FOR SAME SHALL BE SET SCREW TYPE STEEL, WITH INSULATED THROATS ALL WIRING OF ALL SYSTEMS SHALL BE INSTALLED IN CONDUIT UNLESS SPECIFICALLY INDICATED OTHERWISE HEREIN OR ON DRAWINGS

EXPOSED CONDUIT SHALL BE SECURELY SUPPORTED IN PLACE PER CODE BUT ON A MAXIMUM OF 10 FOOT INTERVALS, WITHIN THREE FEET OF EACH BEND, AT EVERY OUTLET OR JUNCTION BOX AND AT THE END OF EACH STRAIGHT RUN TERMINATING AT A BOX OR CABINET CONDUIT SHALL NOT BE SUPPORTED FROM DUCTWORK OR PIPE WORK CONDUITS SHALL BE RUN PARALLEL TO AND AT SO AS TO AVOID SUSPENDED LENGTHS OF CONDUIT SHALL BE INSTALLED AS TO BE ACCESSIBLE FOR REPLACEMENT AND RIGHT ANGLES TO THE BUILDING LINES GENERALLY, CONDUIT SHALL BE RUN IN CONTACT WITH STRUCTURAL PARTS OF THE BUILDING MAINTENANCE AND GENERALLY, CONDUIT SHALL BE INSTALLED TO ERMIT DRAINAGE

CONDUIT RUNS EXCEEDING 100 FEET IN LENGTH OR HAVING IN EXCESS OF THREE 90 DEGREE TURNS SHALL BE PROVIDED WITH PULL BOXES. CONDUIT FILL SHALL NOT EXCEED 30 PERCENT ALL CONDUIT SYSTEMS (INCLUDING J.B.'S, P.B.'S, ETC ) SHALL BE PERMANENTLY IDENTIFIED NEW BRANCH CIRCUIT HOME-RUN CONDUITS SHALL BE NO LARGER THAN 1-1/4" DIAMETER CONDUIT FILL SHALL NOT EXCEED NEC REQUIREMENTS

#### CONDUIT SHALL BE CLEANED INSIDE BEFORE ANY WIRES ARE PULLED CONDUIT ENDS SHALL BE CAPPED AND PLUGGED WITH STANDARD

ACCESSORIES AS SOON AS CONDUIT HAS BEEN PERMANENTLY INSTALLED CONDUIT INSTALLED WITHOUT CONDUCTORS SHALL BE PROVIDED

### WITH SWEEP BENDS AND BALING WIRE FOR PULLING.

ALL JOINTS SHALL BE MADE TIGHT WITH WATERTIGHT COUPLINGS MATCHING CONDUIT AND ALL CORNERS SHALL BE MAKE WITH LONG RADIUS. THE ENDS OF ALL CONDUITS SHALL BE CUT SQUARE AND REAMED AND ALL JOINTS BROL SHOULDER.CONDUIT SHALL BE CONTINUOUS BETWEEN OUTLETS TO MAKE A COMPLETE INSTALLATION AND TO EFFECT A CONTINUOUS GROUND. SUITABLE

SUPPORTS AND FASTENING SHALL BE PROVIDED FOR CONDUIT.

CONDUIT SHALL BE SUPPORTED BY APPROVED STRAPS, FASTENERS AND HANGERS HANGERS SHALL BE SUSPENDED FROM RODSPERFORATED STRAPS WILL NOT BE ACCEPTABLE FASTENERS SHALL BE LEAD EXPANSI

CONCRETE TOGGLE BOLTS IN HOLLOW WALLS, MACHINE SCREWS ON METAL SURFACES AND WOOD SCREWS ON WOOD CONSTRUCTION ALL CONDUIT SHALL BE SUPPORTED INDEPENDENTLY FROM ALL OTHER BUILDING SYSTEM

DIRECTLY FROM STRUCTURAL COMPONENTS.

PROVIDE SLEEVES FOR ALL FIRE WALL AND SMOKE PARTITION PENETRATIONS (SEALED ACCORDINGLY) ALL RACEWAYS SHALL BE ENTIRELY FREE OF PLASTER, MORTAR, WATER AND OTHER FOREIGN MATTER RACEWAYS INSTALLED UNDER THIS CONTRACT WITHOUT CONDUCTORS SHALL HAVE BALING WIRE LEFT IN RACEWAYS FROM OUTLET TO OUTLET FOR FUTURE PULLING OF CONDUCTORS RACEWAYS OPEN ENDS SHALL BE PLUGGED OR CAPPED IN

WHERE "FISHING" THROUGH EXISTING HOLLOW PARTITIONS IS MANDATORY, USE MINIMUM 3/4" "GREENFIELD" (STEEL) FOR LOW VOLTAGE CABLING AND METAL-CLAD/ARMORED CABLE (LISTED FOR USE IN HEALTH CARE FACILITIES) FOR POWER OTHERWISE TYPE MC/AC CABLE MAY ONLY BE USED FOR 6' FIXTURE WHIPS, UNLESS CASE-BY-CASE PERMISSION IS GRANTED BY ENGINEER AND OWNER.

0 METHOD OF WIRING - POWER

T IS PREFERRED A SEPARATE NEUTRAL BE USED WHEN POSSIBLE PER THE NEC. IF A NEUTRAL IS SHARED. ALL UNGROUNDED CONDUCTORS OF A MULTIWIRE BRANCH CIRCUIT MUST BE SIMULTANEOUSLY DISCONNECTED TO REDUCE THE RISK OF SHOCK TO PERSONNEL WORKING ON EQUIPMENT SUPPLIED BY A MULTIWIRE BRANCH CIRCUIT. FOR A SINGLE PHASE INSTALLATION, THE SIMULTANEOUS DISCONNECTION CAN BE ACHIEVED BY TWO SINGLE POLE CIRCUIT BREAKERS WITH AN IDENTIFIED

HANDLE TIE OR BY A 2-POLE SWITCH OR CIRCUIT BREAKER FOR A 3-PHASE INSTALLATION, A 3-POLE CIRCUIT BREAKER OR THREE SINGLE POLE CIRCUIT BREAKERS WITH AN IDENTIFIED HANDLE TIE PROVIDES THE REQUIRED SIMULTANEOUS ISCONNECTION OF THE GROUNDED CONDUCTORS. WHERE FUSES ARE USED FOR BRANCH CIRCUIT OVERCURRENT PROTECTION, A 2-POLE OR 3-POLE SWITCH IS REQUIRED

NEATLY DRESS ALL WORK INSTALL ALL WORK PARALLEL AND PERPENDICULAR TO SURFACES OR EXPOSED STRUCTURAL MEMBERS, AN FOLLOW SURFACE CONTOURS, WHERE POSSIBLE KEEP CONDUCTOR SPLICES TO MINIMUM INSTALL AND TAP CONNECTORS WHICH POSSESS EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATING THAN CONDUCTORS BEING SPLICE AND TAP CONNECTORS WHICH ARE COMPATIBLE WITH CONDUCTOR MATERIA WIRES SHALL BE RUN CONTINUOUS FROM OUTLET TO OUTLET/FIXTURE TO FIXTURE INSULATION VALUE OF JOINTS TO BE 100% IN EXCESS OF WIRE PROVIDE ADEQUATE LENGTH OF CONDUCTORS WITHIN ELECTRICAL ENCLOSURES AND TRAIN THE CONDUCTORS

#### BRANCH SUBFEEDER CIRCUITS SHALL BE INSTALLED AS SHOWN ON THE FLOOR PLANS WHERE OUTLETS ARE INDICATED BY LETTERS ON PLANS, THEY SHALL BE CONTROLLED BY CORRESPONDING SWITCHES NO WIRE SIZE SMALLER THAN NO 12 BE USED FOR ANY BRANCH CIRCUIT UNLESS OTHERWISE NOTED ON PLANS FOR CONTROL CIRCUITS LARGER SIZES SHALL BE USED WHERE REQUIRED AND/OR INDICATED ON THE PLANS DISTANCES FROM PANEL TO FIRST OUTLET OF A 15 OR 20 AMPERE BRANCH CIRCUIT SHALL REQUIRED THE FOLLOWING MINIMUM WIRE SIZE TO THE FIRST OUTLET. UP TO 100 FEET: #12 100 TO 200 FEET: #10 MORE THAN 200 FEET: #8

ALL BRANCH CIRCUITS MORE THAN 200 FEET IN LENGTH SHALL BE MINIMUM NO 10 TO THE LAST OUTLET CONTROL CIRCUITS SHALL BE NO 14 EXCEPT FOR RUNS EXCEEDING 300 FEET WHERE THEY SHALL BE NO 12 OUTLETS SHALL BE LOCATED APPROXIMATELY AS SHOWN ON THE PLANS AND SHALL BE WIRED TO PROVIDE CONTROL OUTLETS INDICATED. ALL WIRES OF ANY ONE CIRCUIT SHALL BE RUN IN THE SAME CONDUIT ALL WIRES SHALL BE RUN CONTINUOUS FROM OUTLET TO OUTLET INSULATION VALUE OF IOINTS TO BE 100% IN EXCESS OF WIRE MECHANICAL WIRE SPLICERS SHALL BE SCOTCHLOCK INSULATED TYPE T&B STAKIN OR APPROVED FOLIAL THE CONDUCTOR TERMINATING AT EACH WIRED OUTLET SHALL BE LEFT NOT LESS THAN 8" LONG AT THEIR OUTLET FITTINGS TO FACILITATE INSTALLMENT OF DEVICES OF FIXTURES FRICTION AND RUBBER TAPE CONFORM TO FEDERAL SPECIFICATIONS HH-T-11 AND HH-T-111. PLASTIC ELECTRICAL TAPE SHALL BE SCOTCH #33+ OR APPROVED EQUAL.

#### TYPE MC CABLE SHALL BE FORMED FROM CONTINUOUS LENGTH OF SPIRALLY WOUND, INTERLOCKED ZINC-COATED OR GALVANIZED (INSIDE & 0UTSIDE) STRIP STEEL ALL CONDUCTORS SHALL BE RATED FOR 90 DEG C MINIMUM PROVIDE WITH FULL SIZED GREEN INSULATED EQUIPMENT GROUND CONDUCTOR PROVIDE COMPATIBLE STEEL FITTINGS WITH INTEGRAL RED PLASTIC INSULATED THROAT BUSHINGS, COMPLIANT WITH NEC 350-5 CABLES SHALL BE 90 DEG C RATED WITH ALL COMPONENTS AND FITTINGS LISTED FOR GROUNDING AND COMPLIANT WITH THE FOLLOWING

a) UL STD4 AND UL STD 83 b) ANSI E119 AND E814 c) NEC ARTICLES 250 AND 333 TYPE MC CABLE MAY BE UTILIZED ONLY IF NEC APPROVED AND IF APPROVED BY LOCAL AUTHORITY HAVING JURISDICTION AND IF INCLUDED IN THE LIMITED APPLICATIONS DEFINED BELOW.

1) ALL NEW 15 OR 20 AMPERE BRANCH CIRCUIT WORK THIS SHALL APPLY ONLY UNDER ALL OF THE FOLLOWING CIRCUMSTANCES AND CONDITIONS. 2) ONLY WHERE CONCEALED (ALL EXPOSED WIRING SHALL BE INSTALLED IN CONDUIT). 3) ROUTE ALL CABLES PERPENDICULAR AND PARALLEL TO THE BUILDING ARCHITECTURAL LINES/SURFACES/STRUCTURAL MEMBERS, KEEPING OFFSETS TO A MINIMUM AND FOLLOWING SURFACE CONTOURS WHERE POSSIBLE. MAINTAIN A UNIFORM ELEVATION FOR ALL CABLE RUNS WHEREVER POSSIBLE. ALL CABLES SHALL BE SUPPORTED/ANCHORED AT MAXIMUM 4<sup>L</sup>0" INTERVALS AND WITHIN 12" OF BOX OR OUTLET AND SHALL NOT SAG. INSTALL CABLES IN A MANNER THAT PREVENTS

### OVERHEATING CABLES SHALL BE FASTENED DIRECTLY TO THE STRUCTURE USING FACTORY CLAMPS/CLIPS SPECIFICALLY DESIGNED FOR THE RESPECTIVE CABLE (CADDY OR EQUAL). 4) ONLY WHERE INSTALLED FOR NORMAL UTILITY CIRCUITS. ALL WIRING FOR EMERGENCY SYSTEM FEEDERS AND RECEPTACLE BRANCH CIRCUITS SHALL BE IN CONDUIT (EMT). NO EXCEPTIONS 11 COMMUNICATION TECHNOLOGY SYSTEMS

GENERAL VOICE AND DATA CABLES SHALL BE INSTALLED IN "J-HOOK" STYLE PATHWAY WHERE INDICATED ON DRAWINGS ALL OTHER WIRING/CABLES OF VOICE/DATA SYSTEMS AND ALL OTHER SYSTEMS SHALL BE INSTALLED IN CONDUIT, 3/4" MINIMUM ROUTE FOR "J-HOOK" WORK ABOVE CEILING IN FIELD IN ADVANCE WITH OWNER.

### PROVIDE OUTLET BOXES AND CONDUIT STUBS FOR SYSTEMS AS INDICATED ON DRAWINGS CONDUIT STUBS SHALL BE TURNED OUT IN JOIST SPACE AND, WHERE LOCATED IN AREAS WITH DRYWALL CEILINGS. SHALL BE EXTENDED TO THE NEAR AREA WITH NO CEILING OR WITH ACOUSTICAL TILE CEILING PROVIDE CONDUIT. BRIDLE RINGS AND RACEWAYS AS REQUIRED ALL CONDUITS SHALL BE PROVIDED WITH SWEEP "L" 90'S AND INSULATED THROAT FITTINGS (OR BUSHINGS). TYPICAL OUTLETS SHALL CONSIST OF A FLUSH WALL MOUNTED 4" SQUARE X 2-1/8" DEEP BOX WITH A DOUBLE GANG PLASTER RING MAXIMUM CONDUIT FILL FOR NEW WORK SHALL BE 40%, BASED ON MANUFACTURE'S PUBLISHED DATA OF

CABLE OUTSIDE DIAMETER. CABLE, TERMINATIONS, JACKS, LABELING, HARDWARE, SHALL BE PROVIDED BY A CERTIFIED COMMUNICATION TECHNOLOGY CONTRACTOR CABLING SYSTEM SHALL BE PROVIDED AS REQUIRED FOR A TURNKEY, COMPLETE WORKING SYSTEMS.

SHALL BE

# BY 3/8" HIGH.

LABELING/IDENTIFICATION METHOD. TO IDENTIFY RUNS OF DIFFERENT SYSTEMS. ALL CABLES WHICH ARE NOT ROUTED IN CONDUIT SHALL BE NEATLY BUNDLED, SECURED AT 4'-0" INTERVALS AND IDENTIFIED AT TEN FOOT INTERVALS WHEREVER POSSIBLE, BUNDLE CABLES OF THE SAME SYSTEM TOGETHER PROVIDE ADDITIONAL WALL OUTLET BOXES AND ADDITIONAL WHIPS AS/IE REQUIRED AT SYSTEMS FURNITURE TO ACHIEVE SAME "J-HOOK" PATHWAYS

TO TERMINAL POINTS WITH NO EXCESS BUNDLE MULTIPLE CONDUCTORS, WITH CONDUCTORS LARGER THAN NO 10 AWG CABLED IN INDIVIDUAL CIRCUITS MAKE TERMINATIONS SO THERE IS NO BARE CONDUCTOR AT THE TERMINAL.

ROLLED

12 OUTLET, JUNCTION AND SWITCHBOXES

ON THE DRAWINGS OR IN THE FIELD AS REQUIRED.

WHERE DRYWALL CEILINGS ARE USED, THE ELECTRICAL CONTRACTOR SHALL NOT INSTALL JUNCTION BOXES ABOVE THE CEILING IN INACCESSIBLE LOCATIONS FIELD COORDINATE WITH THE CONSTRUCTION MANAGER PRIOR TO ROUGH-IN TO CONFLICTS JUNCTION BOXES ABOVE LAY-IN CEILINGS ARE ACCEPTAB 13 HEIGHT OF BOXES

NOTED ON PLANS SWITCHES

TELEPHONE OUTLETS (WALL PHON FIRE ALARM MANUAL PULL STATIC FIRE ALARM A/V ALARMS DEVICES AT SPECIAL HEIGHTS AS DIRECTED IN FIELD

14 WIRE AND CAE FURNISH AND INSTALL ALL NEC

FED FROM ISOLATED POWER SYSTEMS. EEP CONDUCTOR SPLICES TO MINIMUM PULL CONDUCTORS SIMULTANEOUSLY WHERE MORE THAN ONE IS BEING INSTALLED IN SAME RACEWAY USE UL LISTED PULLING COMPOUND OR LUBRICANT, WHERE NECESSARY INSTALL SPLICE AND TAP NNECTORS WHICH POSSES EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATING THAN CONDUCTORS BEING SPLICE AND TAP CONNECTORS WHICH ARE COMPATIBLE WITH CONDUCTOR MATERIAL INCREASE

PROVIDE COLOR (

WIRING

## ES PER NEC TO OFFSET VOLTAGE DROP AS/IF REQUIRED **RING DEVICES**

**DEVICE COLORS:** 

SWITCHES:

PROVIDE WALL PLATES WITH ENGRAVED LEGENDS WHERE INDICATED ON DRAWINGS AND/OR WHERE REQUIRED PER ELECTRICAL IDENTIFICATION SECTION ALL DEVICE WALL PLATES SHALL BE STANDARD SIZE; "MIDWAY", "OVERSIZED" ("JUMBO") OR "EXTRA DEEP" WALLPLATES SHALL NOT BE ACCEPTABLE CONSTRUCT WITH METAL SCREWS FOR SECURING PLATES TO DEVICES; SCREW HEADS COLORED TO MATCH FINISH OF PLATES WALLPLATES COLOR TO MATCH DEVICE, WITH BEVELED EDGES, EQUAL TO LEVITON COMMERCIAL SPECIFICATION GRADE NYLON UNLESS OTHERWISE SPECIFIED IN CONTRACT DOCUMENTS

WALL PLATES:

3- WAY 120/277 SWITCHES SHALL BE EQUAL TO LEVITON 1223-2 SERIES; PILOT LIGHT SWITCHES SHALL BE EQUAL TO 1223-PL OCCUPANCY SENSOR DEVICES SHALL BE AS SPECIFIED IN CONTRACT DOCUMENTS.

SINGLE POLE 120/277 SWITCHES SHALL BE EQUAL TO LEVITON # 1221-2 SERIES. PILOT LIGHT SWITCHES SHALL BE EQUAL TO 1221-PL DOUBLE-POLE 120/277 SWITCHES SHALL BE EQUAL TO LEVITON # 1222-2 SERIES; PILOT LIGHT SWITCHES SHALL BE EQUAL 1222-PL

SPECIAL PURPOSE RECEPTACLES SHALL BE OF THE SIZE, TYPE AND MANUFACTURER AS INDICATED ON THE PLANS OR AS DETERMINED IN FIELD.

DUPLEX ISOLATED GROUND 120V RECEPTACLES SHALL BE EQUAL TO LEVITON # 5362-IG. SINGLE ISOLATED GROUND 120V RECEPTACLES SHALL BE EQUAL TO LEVITON #5361-IG (NEMA 5-20R).

CONTROLLED DUPLEX 120V RECEPTACLES SHALL BE EQUAL TO LEVITON # 5362-S2 SERIES (NEMA 5-20R). GROUND FAULT CIRCUIT INTERRUPTER DUPLEX 120V RECEPTACLES SHALL BE EQUAL TO LEVITON #8899 SERIES (NEMA 5-20R).

DUPLEX 120V RECEPTACLES SHALL BE EQUAL TO LEVITON # 5362 SERIES (NEMA 5-20R).

SPECIFICATION GRADE RECEPTACLES:

DEVICES SHALL BE WHITE UNLESS OTHERWISE SPECIFIED IN CONTRACT DOCUMENTS.

COPPER. PROVIDE STRANDED CONDUCTORS FOR ALL SIZES UNLESS INDICATED OTHERWISE. INSULATION FOR ALL CONDUCTORS SIZE 500 MCM (KCMIL) AND LARGER, AND NO 8 AWG AND SMALLER FOR ALL OTHER SIZES PROVIDE THW OR THHN/THWN INSULATION AS APPROPRIATE FOR THE LOCATIONS WHERE

SARY CABLE OF THE SIZE AND TYPE INDICATED ON THE DRAWINGS OR SPECIFIED HEREIN AFTER ALL WIRE SHALL BE COPPER ALL WIRING SHALL BE NEW NO WIRE SMALLER THAN 12 GA SHALL BE INSTALLED UNLESS SPECIFICALLY DESIGNATED. USE OF #14 COLOR CODED WIRE WILL BE ALLOWED FOR CONTROL CIRCUITS ONLY. ALL WIRING SHALL BE IN CONDUIT UNLESS SPECIFICALLY INDICATED OTHERWISE HEREIN. ALL CONDUCTORS SHALL BE

NOT LOCATED AT COUNTER AREAS, THE HEIGHT OF BOXES FROM FINISHED FLOOR TO CENTER OF BOXES SHALL BE AS FOLLOWS, UNLESS OTHERWISE.

PRIOR TO ROUGH-IN VERIFY ALL BOX/DEVICE MOUNTING HEIGHTS AND LOCATIONS IN FIELD WITH OWNER'S REPRESENTATIVE RELATIVE TO EQUIPMENT BEING SERVED AND RELATIVE TO EXISTING CONDITIONS WHERE APPLICABLE IN GENERAL

TION/JACKET FOR PHASE IDENTIFICATION ALL WIRES SHALL BE RATED AT 600 VOLTS. PROVIDE TYPE XHHW-2 INSULATION FOR ALL WIRING SUBJECT TO MOISTURE, FOR ALL WIRING BELOW GRADE AND FOR ALL

WHERE OUTLET BOXES OCCUR IN BLOCK, CINDER, OR CONCRETE BLOCK, FACING TILE OR OTHER MATERIAL WHERE SUCH MATERIALS FORM THE FINISHED WALL SURFACE, THE OPENING FOR THE BOX SHALL BE CUT NEATLY AND OF THE SIZE THAT THE COVER PLATE WILL COVER ALL PARTS OF THE OPENING. CONDUIT SHALL BE USED ON EXPOSED RACEWAYS IN GENERAL, JUNCTION BOXES SHALL BE FURNISHED AND REQUIRED BY THE NATIONAL ELECTRIC CODE, OF THE PROPER SIZES, AND SHALL BE CONSTRUCTED OF #12 GAUGE STEEL WITH REMOVABLE FRONT FASTENED ON WITH COUNTER SUNK HEAD SCREWS OR OTHER APPROVED MEANS FOR SPECIAL APPLICATION, JUNCTION BOXES SHALL BE NOTED, DETAILED AND/OR SIZED

GANG TYPE OUTLET BOXES SHALL NOT BE USED THE OUTLET BOX LOCATIONS INDICATED ON DRAWINGS SHALL BE CONSIDERED APPROXIMATE AND THEREFORE IT SHALL BE INCUMBENT UPON THIS CONTRACTOR TO STUDY THE GENERAL CONSTRUCTION WITH RELATION TO SPACES AND EQUIPMENT SURROUNDING EACH OUTLET ALL OUTLET, SWITCH AND JUNCTION BOXES SHALL BE MADE OF CODE GALVANIZED STEEL COMPLETE WITH RINGS AND SCREW COVER PLATES AND LOCATED WHERE SHOWN AND NOTED ON DRAWINGS WHERE CONDUIT IS CONCEALED, BOXES SHALL NOT BE LESS THAN 4" SQUARE X 1-1/2" DEEP ALL BOXES SHALL BE EQUIPPED WITH PROPER COVERS TO BRING FLUSH WITH FINISHED WALL

ROUTE ALL BRIDLE RING PATHS AND CABLES PERPENDICULAR AND PARALLEL TO THE BUILDING ARCHITECTURAL LINES, KEEPING OFFSETS TO A MINIMUM INSTALL BRIDLE RINGS IN A UNIFORM PLANE/ELEVATION WHEREVER POSSIBLE, KEEPING VERTICAL OFFSETS TO AN ABSOLUTE MINIMUM PRIOR TO INSTALLATION, SUBMIT SCALED COORDINATION DRAWINGS SHOWING ALL PROPOSED ROUTING AND RING LOCATIONS FOR REVIEW BY OWNER KEEP OFFSETS TO AN ABSOLUTE MINIMUM BRIDLE RING PATHS SHALL BE ROUTED SO THAT A MINIMUM OF 24" EXISTS BETWEEN ANY CABLES AND ANY EMI SOURCE SUCH AS BALLASTS, MOTORS, POWER WIRING, ETC.

SIMILAR OPEN AREAS WHEREVER POSSIBLE TO MINIMIZE WALL PENETRATIONS SECURELY ANCHOR (MECHANICAL - NOT ADHESIVE) ALL RINGS DIRECTLY TO STRUCTURAL COMPONENTS OF THE BUILDING RINGS SHALL NOT BE ANCHORED TO DUCTWORK, CONDUIT, PIPING, FIXTURES, EQUIPMENT, CEILING SUPPORTS, ETC ALL RINGS SHALL BE FULLY AND READILY ACCESSIBLE AFTER INSTALLATION NEATLY ROUTE BRIDLE RING PATHS PARALLEL AND PERPENDICULAR TO BUILDING

CABLE DISTRIBUTION BRIDLE RINGS SHALL BE EQUAL TO CADDY #4BRT64 OR MONO-SYSTEM INC. "THE HOOK" (MINIMUM 4"Ø OR 4" SQUARE USABLE INTERNAL AREA) CONSTRUCTED OF ALUMINUM OR CORROSION RESISTANT STEEL WITH EDGES OR EQUIVALENT TO PREVENT DAMAGE TO CABLE JACKETS AND INSULATION PROVIDE SPLITS OR OPENINGS SO THAT CABLES CAN BE LAID IN THE RINGS RATHER THAN THREADED THROUGH PROVIDE MAXIMUM 30% FILL (IN CROSS SECTION), BASED ON OUTSIDE DIAMETER OF CABLES ACCORDINGLY, PROVIDE MULTIPLE SETS OF RINGS ALONG ANY ROUTES AS/IF REQUIRED, PROVIDE RINGS AT FOUR FOOT INTERVALS AND AT ALL OFFSETS ROUTE RINGS THROUGH CORRIDORS

INSTALL POWER CABLES IN A MANNER WHICH PREVENTS OVER-HEATING OTHERWISE, WHEREVER POSSIBLE, BUNDLE CABLES OF THE SAME SYSTEM TOGETHER ALSO PROVIDE COLOR CODED JACKETS, OR OTHER APPROVED

REVIEW ALL TERMINATION AND LABELING REQUIREMENTS WITH OWNER IN ADVANCE ALL CABLE SHALL BE PROVIDED WITH PERMANENT ADHESIVE LABELING IDENTIFICATION BY THIS CONTRACTOR PROVIDE TRANSPARENT ADHESIVE COVERINGS OVER EACH LABEL, WRAPPED AROUND THE LABELS AT ;EAST TWO TIMES. THE LONG AXIS OF THE LABELS SHALL BE PARALLEL TO THE LONG AXIS OF THE RESPECTIVE CABLE ASSEMBLIES LABELS SHALL BE APPROXIMATELY 1-1/2" LONG

PROVIDE COLOR CODED JACKETS TO IDENTIFY RUNS OF DIFFERENT SYSTEMS NEATLY ROUTE CABLES PARALLEL AND PERPENDICULAR TO BUILDING ARCHITECTURAL LINES. GROUP CABLES BY SYSTEM TYPE WHEREVER POSSIBLE. VERIFY EXACT LOCATIONS OF TELEPHONE SWITCH, DATA SERVER(S), HEAD-END EQUIPMENT, EQUIPMENT OUTLETS, ETC. IN FIELD.

RADII SHALL 6E MINIMUM AS DIRECTED BY CABLE MANUFACTURER USE PULLING COMPOUND OR LUBRICANT, WHERE NECESSARY; COMPOUND MUST NOT DETERIORATE CONDUCTOR OR INSULATION NEATLY DRESS ALL CABLE WORK WORK INSTALLED IN A MANNER WHICH RESULTS IN MAINTAINING A MINIMUM DISTANCE OF 24 INCHES FROM FEEDER/BRANCH CIRCUIT RACEWAYS AND FROM ANY BALLASTED LIGHTING FIXTL

DETERMINE EXACT LOCATIONS OF COMMUNICATION TECHNOLOGY EQUIPMENT. EQUIPMENT OUTLETS. ETC IN FIELD USE CAUTION NOT TO EXCEED THE ALLOWED BENDING RADIUS FOR RESPECTIVE CABLES AND NOT TO COMPROMISE THE INTEGRITY OF THE CABLE DURING INSTALLATION BY PULLING TIE-WRAPS TOO TIGHTLY, DAMAGING CABLES, ETC RACEWAY/CABLING BENDING

THIS CONTRACTOR SHALL DO ALL CUTTING AND PATCHING REQUIRED FOR THE ADMISSION OF HIS WORK ANY DAMAGE DONE BY THIS CONTRACTOR TO THE BUILDING DURING THE PROGRESS OF HIS WORK SHALL BE MADE GOOD AT HIS OWN EXPENSE ALLPATCHING SHALL BE DONE BY A SKILLE CRAFTSMAN IN THAT RESPECTIVE TRADE IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO SUPERVISE THE INSTALLATION OF, AND PAY FOR ALL ADDITIONAL MEMBERS, WOOD OR METAL AND LABOR WHICH MAY BE REQUIRED TO SUPPORT ANY TYPE OF PERMANENT OR TEMPORARY ELECTRICAL APPARATUS EMPLOYED IN THE EXECUTION OF THIS CONTRACTOR'S WORK.
SEAL ALL FLOOR, CEILING WALL, SLAB, ETC. PENETRATIONS TO MATCH OR EXCEED EXISTING /NEW ASSEMBLY FIRE RATINGS. PROVIDE SLEEVE SEALS FOR ALL SLEEVES; PROVIDE SLEEVES FOR ALL PENETRATIONS VERIFY REQUIREMENTS IN FIELD ALL PENETRATIONS OF FIRE-RATED O SMOKE-RATED WALLS, FLOORS, CEILINGS, ETC SHALL BE SEALED IMMEDIATELY AFTER RACEWAYS ARE INSTALLED ALL NEW ELECTRICALLY RELATED WORK SHALL BE SUPPORTED DIRECTLY FROM BUILDING STRUCTURAL MEMBERS NEW ELECTRICALLY RELATED WORK SHALL NOT BE SUPPORTED FROM DUCTWORK, DUCTWORK HANGERS, CEILING SUPPORTS, EXISTING CONDUIT SUPPORTS, ETC ALL CONDUITS (AND CABLE ASSEMBLIES, WHERE APPLICABLE SHALL BE ROUTED PARALLEL TO BUILDING STRUCTURAL MEMBERS ANY AND ALL NONCOMPLIANT WORK INSTALLED BY THE ELECTRICAL CONTRACTOR SHALL BE REMOVED AND REINSTALLED TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE AND THE ENGINEER, AT THE EXPENSE OF THE ELECTRICAL CONTRACTOR.
ALL SURFACE MOUNTED LED FIXTURES SHALL BE MOUNTED WITH AIR SPACES BETWEEN FIXTURE AND SURFACE PER LATEST EDITION OF NFPA/NEC ALL RECESSED FIXTURES SHALL BE EQUIPPED WITH NECESSARY PLASTER FRAMES AND SURFACE TRIM ALL RECESSED LED FIXTURES SHALL BE EQUIPPED AND SUITABLY CONSTRUCTED TO OPERATE WITH SUITABLE LED DRIVERS ALL RECESS MOUNTED LED FIXTURES SHALL BE EQUIPPED AND SUITABLY CONSTRUCTED TO OPERATE WITH SUITABLE LED DRIVERS ALL RECESS MOUNTED LED FIXTURES SHALL HAVE UL APPROVED THERMAL PROTECTION PER LATEST EDITION OF NFPA/NEC ALL JUNCTION BOXES AND SERVICEABLE COMPONENTS (LED DRIVERS, THERMAL PROTECTION DEVICES, FUSES, ETC ) FOR RECESSED FIXTURES SHALL BE READILY ACCESSIBLE FOR SERVICE OR REPLACEMENT FROM BELOW THE CEILING, WITHOUT REMOVING ANY CEILING COMPONENTS (OTHER THAN TILES).
WHERE PLASTER FRAMES ARE INFERRED FOR LIGHTING FIXTURES (EITHER BY NARRATIVE OR BY CATALOG NUMBER OR BY APPLICATION) THE ACTUAL FUNCTION SHALL BE TAKEN TO MEAN FOR MOUNTING WITHIN GYPSUM BOARD OR SIMILAR TYPE CEILING SYSTEM (I.E.NOT WITHIN WET PLASTER CEILING SYSTEM). ALL LIGHTING FIXTURE UTILIZED FOR EMERGENCY EGRESS LIGHTING SHALL BE CONNECTED AHEAD OF SWITCHING. ALL BALLAST OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND CATALOG NUMBER ALL LAMPS OF THE SAME TYPE SHALL BE OF THE SAM MANUFACTURER AND CATALOG NUMBER.
ALL FIXTURES SHOWN ON DRAWINGS WITH MULTI-LEVEL SWITCHING SHALL BE PROVIDED WITH MULTIPLE BALLASTS TO ACCOMMODATE SAME ALL OTHER FIXTURES MAY CONTAIN EITHER SINGLE BALLASTS OR MULTIPLE BALLASTS AS REQUIRED TO TO FULFILL REQUIRED FUNCTION AND AS REQUIRED TO COMPLY WITH CONSTRUCTION SCHEDULE.
INCANDESCENT LAMPS SHALL BE SYLVANIA OR PHILIPS, LONG LIFE TYPE (3,000 HOURS) ALL INCANDESCENT LAMPS SHALL BE INSIDE FROSTED UNLESS SPECIFICALLY DIRECTED OTHERWISE PROVIDE SOCKET ADAPTERS/EXTENDERS IF REQUIRED FOR ACCOMMODATING THE SPECIFICALLY DIRECTED LAMP.
PROVIDE FIXTORES AND/OK FIXTORE OUTLET BOXES WITH HANGERS TO PROPERLY SUPPORT FIXTORE WEIGHT. ALL LIGHTING FIXTORES INSTALLED IN OR ON SUSPENDED CEILING SYSTEMS SHALL BE ANCHORED DIRECTLY TO THE BOILDING STRUCTURAL SYSTEM ABOVE (ANCHORED PER NEC). SUCH ANCHORING SHALL BE INDEPENDENT OF THE CEILING SUPPORT SYSTEM. ALL FIXTURES SHALL 6E INSTALLED PLUMB AND LEVEL. SUPPORT SURFACE MOUNTED FIXTURES GREATER THAN 2 FEET IN LENGTH AT A POINT IN ADDITION TO THE OUTLET BOX FIXTURE STUD. REPLACE DEFECTIVE LAMPS FOR A PERIOD OF ONE YEAR FOLLOWING THE TIME OF SUBSTANTIAL COMPLETION WHERE USED FOR TEMPORARY LIGHTING PRIOR TO TIME OF SUBSTANTIAL COMPLETION, REPLACE ALL INCANDESCENT LIGHTING FIXTURE
LAMPS, AS WELL AS ANY LAMPS WHICH ARE DEFECTIVE, DAMAGED OR BURNED OUT. FOR ALL EXISTING FIXTURES WHICH ARE SCHEDULED FOR REUSE, REMOVE FROM EXISTING CEILINGS DURING DEMOLITION; PROTECT DURING CONSTRUCTION; CLEAN, SERVICE (IF REQUIRED), RE-LAMP (WITH LAMPS TO MATCH BUILDING STANDARD OR PER THIS SECTION AS NOTED) AND REINSTALL AT LOCATIONS INDICATED.
FOR ALL EXISTING FIXTURES WHICH ARE SCHEDULED TO BE REMOVED AND TURNED OVER TO OWNER, THE FIXTURES SHALL BE DISCONNECTED, CAREFULLY REMOVED AND TURNED OVER TO OWNER TRANSFER SUCH FIXTURES TO STORAGE AREA AS DIRECTED IN FIELD. 18 MECHANICAL EQUIPMENT
PROVIDE ALL CONDUIT AND OUTLET BOXES AS REQUIRED FOR ALL CONTROL WIRING AND THERMOSTATS FURNISH AND INSTALL POWER WIRING AND MAKE LINE CONNECTIONS TO ALL HEATING, VENTILATING AND AIR CONDITIONING EQUIPMENT ELECTRICAL CONTRACTOR SHALL EXAMINE THE APPROVED DRAWINGS OF ALL BRANCHES AND SHALL WIRE AND CONNECT ALL MOTORS, DISCONNECTS, CONTROL DEVICES AND OTHER ITEMS REQUIRING ELECTRICITY FOR OPERATION. THIS CONTRACTOR SHALL MAKE THE NECESSARY ELECTRICAL CONNECTIONS BETWEEN THE SPECIFIED EQUIPMENT AND THE JUNCTION BOX NEAR EQUIPMENT WITH FLEXIBLE METALLIC CONDUIT AND MATCHED CONNECTORS. NO FLEXIBLE CONDUIT SHALL BE EXPOSED IN FINISHED ROOMS. EACH MOTOR SHALL HAVE DISCONNECT SWITCH OR MANUAL STARTER INSTALLED BY THIS CONTRACTOR AHEAD OF MOTOR OR MOTOR MAGNETIC STARTER THE ELECTRICAL CONTRACTOR SHALL PROVIDE CONTROL AND INTERLOCK WIRING AS SPECIFICALLY INDICATED ON THE DRAWINGS ALL OTHER CONTROL WIRING REQUIRED FOR OPERATION OF THE SYSTEMS SHALL BE PROVIDED BY THE HEATING CONTRACTOR. 19 ELECTRICAL DISTRIBUTION EQUIPMENT
DISCONNECTS, STARTERS & FUSES: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE EQUIPMENT OF ONE OF THE FOLLOWING (FOR EACH TYPE AND RATING): SQUARE D COMPANY
DISCONNECT SWITCHES SHALL BE EQUAL TO SQUARE D TYPE HD ALL SAFETY SWITCHES/DISCONNECTS SHALL BE HEAVY DUTY SAFETY TYPE, QUICK MAKE AND QUICK BREAK AND EXTERNALLY OPERATED. UNLESS NOTED OTHERWISE ON DRAWINGS OR DIRECTED OTHERWISE IN FIELD, ALL DISCONNECT SWITCHES SHALL BE FUSED UNLESS NOTED OTHERWISE ON DRAWINGS OR DIRECTED OTHERWISE IN FIELD, BRACE ALL DISCONNECT SWITCHES FOR 200,000 A.I.C. PROVIDE HEAVY-DUTY SWITCHES, WITH FUSES OF CLASSES AND CURRENT RATINGS INDICATED AND UL LISTED FOR USE AS SERVICE EQUIPMENT UNDER UL STANDARD 98 OR 889 SEE SECTION "FUSES" FOR SPECIFICATIONS WHERE CURRENT LIMITING FUSES ARE INDICATED, PROVIDE SWITCHES WITH NON-INTERCHANGEABLE FEATURE SUITABLE ONLY FOR CURRENT LIMITING TYPE FUSES INSTALL DISCONNECT SWITCHES WITHIN SIGHT OF CONTROLLER POSITION UNLESS OTHERWISE INDICATED.
EXCEPT AS OTHERWISE INDICATED, PROVIDE MOTOR STARTERS AND ANCILLARY COMPONENTS; OF TYPES, SIZES, RATINGS AND ELECTRICAL CHARACTERISTICS INDICATED, WHICH COMPLY WITH MANUFACTURER'S STANDARD MATERIALS, DESIGN AND CONSTRUCTION I ACCORDANCE WITH PUBLISHED PRODUCT INFORMATION, AND AS REQUIRED FOR COMPLETE INSTALLATIONS ALL STARTERS SHALL BE EQUIPPED WITH PILOT LIGHTS. ALL STARTERS SHALL BE SIZED ACCORDING TO LOAD BEING SERVED OR AS NOTED ON DRAWINGS, WHICHEVER REQUIREMENT IS LARGER MANUAL AND MAGNETIC STARTERS THERMAL OVERLOAD ELEMENTS SHALL BE RATED BETWEEN 115% AND 125% FULL LOAD CURRENT OR AS CALLED FOR UNDER NEC. INSTALL AND CONNECT CAPACITORS FURNISHED BY HVAC CONTRACTORS AHEAD OF OVERLOADS WHERE APPLICABLE.
PROVIDE SINGLE-PHASE AC FRACTIONAL HP MANUAL MOTOR STARTERS, OF SIZES AND RATINGS REQUIRED EQUIP WITH MANUALL OPERATED QUICK-MAKE, QUICK-BREAK TOGGLE MECHANISMS; AND WITH ONE-PIECE MELTING ALLOY TYPE THERMAL UNITS EQUI WITH THERMAL OVERLOAD RELAY WITH FIELD ADJUSTMENT CAPABILITY OF PLUS OR MINUS 10% VARIATION OF NOMINAL OVERLOAD HEATER RATING, FOR PROTECTION OF FRACTIONAL HP MOTORS AS SHOWN ON DRAWINGS STARTER SHALL BECOME INOPERATIVE WHEN THERMAL UNIT IS REMOVED. PROVIDE STARTERS WITH DOUBLE BREAK SILVER ALLOY CONTACTS, VISIBLE FROM BOTH SIDES OF STARTER; GREEN PILOT LIGHTS AND SWITCH CAPABLE OF BEING PADLOCKED-OFF MANUAL STARTERS SHALL BE EQUAL TO THE FOLLOWING.
SQUARE D #2510 FLUSH MOUNTED, 2-POLE TOGGLE SWITCH PE WITH NEON PILOT AND NEMA 1 TYPE ENCLOSURE FOR FLUSH WALL INSTALLATION MANUAL STARTER FOR EXPOSED CONDUIT INSTALLATION:
SQUARE D # 8536 SURFACE MOUNTED 2-POLE TOGGLE SWITCH TYPE WITH NEON PILOT AND NEMA 1 TYPE PE FG-2 ENCLOSURE FOR SURFACE WALL INSTALLATION. <u>FUSES:</u> SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE FUSES OF ONE OF THE FOLLOWING ALL FUSES SHALL BE OF THE SAME MANUFACTURER: BUSSMAN, LITTELFUSE.
EXCEPT AS OTHERWISE INDICATED, PROVIDE FUSES OF TYPES, SIZES, RATINGS AND AVERAGE TIME-CURRENT AND PEAK THROUGH CURRENT CHARACTERISTICS INDICATED, WHICH COMPLY WITH MANUFACTURER'S STANDARD DESIGN, MATERIALS, AND CONSTRUCTED I ACCORDANCE WITH PUBLISHED PRODUCT INFORMATION, AND WITH INDUSTRY STANDARDS AND CONFIGURATIONS FUSES 1 AMPERE THROUGH 600 AMPERES SHALL BE REJECTION TYPE FUSES 601 AMPERES THROUGH 6,000 AMPERES SHALL BE HI-CAP BOLT TYPE.
EACH FUSE SHALL BE CLEARLY FACTORY MARKED WITH CLASSIFICATION, CHARACTERISTICS, AMPERE RATINGS, VOLTAGE RATINGS, ETC FUSES SHALL NOT BE SHIPPED INSTALLED IN SWITCHES NOR SHALL THEY BE INSTALLED IN THE EQUIPMENT UNTIL THE EQUIPMENT UNTIL THE EQUIPMENT IS READY TO BE ENERGIZED. ALL FUSES SHALL BE OF THE SAME MANUFACTURER.
SUPPLIED, BUT NOT LESS THAN ONE SET OF 3 OF EACH KIND. PRIOR TO INSTALLING FUSES FOR PROTECTION OF SPECIFIC EQUIPMENT, MOTORS, ETC, VERIFY RECOMMENDED FUSE SIZE TYPE IN FIELD FROM RESPECTIVE EQUIPMENT MANUFACTURER. IF A CONFLICT IN FUSE SIZE /TYPE RESULTS BETWEEN MANUFACTURE'S RECOMMENDATIONS AND ABOVE SPECIFICATIONS, CONTACT ENGINEER. PROVIDE ALL REQUIRED FUSES UNDER BASE BID INSTALL FUSES IN FUSED SWITCHES.
LIGHTING CONTACTORS & HIMECLOCKS: LIGHTING CONTACTORS SHALL BE EQUAL TO SQUARE D "TYPE L" SERIES FOR NON-MOTOR LOADS (I.E. FOR TUNGSTEN & BALLAST LIGHTING AND RESISTANCE HEATING LOADS), ELECTRICALLY OPERATED, ELECTRICALLY HELD, IN NEMA 1 ENCLOSURE, WITH 120V COIL 2 THROUGH 12-POLE VERSIONS AND CHARACTERISTICS AS INDICATED ON DRAWINGS OR AS REQUIRED DRY CONTACTS SHALL BE RATED AT 30A, 208V OR 600V AS REQUIRED VERIFY ALL COIL VOLTAGE RATINGS IN FIELD. USE TORK DTS400B TIME CLOCK THAT SHALL BE PROGRAMMABLE 365 DAY, 24 HOUR WITH OVERRIDE CONTROLS UNIT SHALL BE 4 CHANNEL PROVIDE ALL REQUIRED EXTERNAL CONTACTORS, RELAYS, ETC. TO RENDER THE CONTROL SYSTEMS FULLY OPERATIONAL VERIFY ZONE CONTROL REQUIREMENTS IN FIELD PRIOR TO ROUGH-IN. PROVIDE BATTERY BACKUP EXTENDED POWER CARRYOVER CUSTOM PROGRAMMING SHALL BE CONFIGURED AS SPECIFIED BELOW.
OPERATING HOURS SHALL BE SET AS FOLLOWS: 1 VERIFY WITH LANDLORD AND OWNER FOR EXACT SETTINGS.

AND SHALL NUT BE REPRODUCED WITHOUT THE WRITTEN CONSENT OF NY ENGINEERS. PROJECT
REVISIONS DATES:
PROFESSIONAL SEAL
ISSUE DATE: PROJECT #: DRAWN BY: NYE CHECKED BY: NYE
ELECTRICAL NOTES
E-1

# **ELECTRICAL PLAN NOTES**

### PANELBOARDS

SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PANELBOARD PRODUCTS OF THE FOLLOWING (FOR EACH TYPE AND RATING OF PANELBOARD AND ENCLOSURE): SQUARE D COMPANY

PANELS SHALL BE DEAD FRONT, SAFETY TYPE, FURNISHED WITH BRANCH CIRCUIT PROTECTING DEVICES, EQUIPMENT GROUNDING BOX, MAIN BUS AND CABLE LUGS FACTORY ASSEMBLED. WITH ALL COMPONENTS IN PLACE. READY FOR INSTALLATION. CABINET SIZES ARE BASED UPON A 20" WIDE BY 6" DEEP PANEL UNLESS OTHERWISE NOTED PANELBOARDS SHALL BE EQUIPPED WITH FLUSH TYPE LOCK AND CATCH. ALL LOCKS SHALL BE KEYED ALIKE. AND TWO KEYS ARE TO BE SUPPLIED WITH EACH LOCK. PANELBOARDS SHALL BEAR UL LABELS FOR THEIR SPECIFIC APPLICATIONS. PANELBOARDS SHALL BE SUITABLE FOR SERVICE VOLTAGE WITH NUMBER OF BRANCH CIRCUITS OF CAPACITY SCHEDULED UNLESS. DTHERWISE INDICATED, PANELBOARDS AND SECTIONS THEREOF, IF ANY, SHALL HAVE MAIN LUGS ONLY OF CAPACITY EQUAL TO OR GREATER THAN THE RATING OR SETTING OF THE OVER THE CURRENT PROTECTIVE DEVICE NEXT BACK ON THE LINE ALL CIRCUIT BREAKER PANELBOARD BUS ASSEMBLIES SHALL BE OF THE DISTRIBUTED (SEQUENCE) BUSSING TYPE THROUGHOUT, SO THAT ANY 2 ADJACENT SINGLE POLE BREAKERS AND/OR SPACES SHALL BE REPLACEABLE BY A 2 POLE INTERNAL COMMON TRIP BREAKER, AND ANY 3 ADJACENT SINGLE POLE BREAKERS AND OR SPACES SHALL BE REPLACEABLE BY A 3 POLE INTERNAL COMMON TRIP BREAKER, 15 AMP THROUGH 70 AMP INCLUSIVE, WITHOUT DISTURBING ANY OTHER BREAKER.ALL PANELBOARDS SHALL BE UL LISTED AND LABELED FOR USE AS SERVICE ENTRANCE EQUIPMENT WHERE BEING USED AS SUCH.

DISTRIBUTION PANELS SHALL BE SQUARE D I-LINE.

120/240V LIGHTING AND APPLIANCE PANELBOARDS SHALL BE EQUAL TO SQUARE D NQOD WITH BOLT-ON BRANCH BREAKERS.

ALL BUSSING SHALL BE COPPER CURRENT CARRYING CONTACT SURFACES SHALL BE SILVER OR TIN PLATED MAIN BUSES AND CONNECTORS SHALL BE HARD DRAWN COPPER OF 98% CONDUCTIVITY, WITH CURRENT CARRYING CAPACITY TO MAINTAIN ESTABLISHED RISE TESTS AS DEFINED IN UL STANDARD UL 67

LL BRANCH CIRCUIT BREAKERS SHALL BE FULL AMBIENT COMPENSATED THERMAL MAGNETIC MOLDED CASE WITH QUICK-MAKE AND QUICK-BREAK ACTION AND POSITIVE HANDLE TRIP INDICATION. BOTH ON MANUAL AND ON AUTOMATIC OPERATION BREAKERS SHALL BE OF THE OVER-THE-CENTER TOGGLE OPERATING TYPE WITH THE HANDLE GOING TO A POSITION BETWEEN "ON" AND "OFF" TO INDICATE AUTOMATIC TRIPPING

ALL CIRCUIT BREAKERS SHALL BE FULL SIZE "TANDEM" OR "SPLIT" BREAKERS SHALL NOT BE PERMITTED ALL MULTI-POLE BREAKERS SHALL HAVE INTERNAL COMMON TRIP WITH ALL LOAD SIDE BOX LUGS OF ONE BREAKER IN THE SAME GUTTER ALL CIRCUIT BREAKERS SHALL HAVE SEALED CASES TO PREVENT TAMPERING ALL 15 AND 20 AMPERE BRANCH CIRCUIT BREAKERS SHALL BE UL LISTED AS SWD (SWITCHING DUTY). ALL 15-70 AMPERE BRANCH CIRCUIT BREAKERS SHALL BE HACR TYPE ALL GFI CIRCUIT BREAKERS SHALL BE UL CLASS A WITH MAXIMUM THRESHOLD OF 5 MA ALL BRANCH CIRCUIT BREAKERS SERVING ALL BALLASTED (FLUORESCENT/HID) LIGHTING LOADS SHALL BE HID RATED. PROVIDE 20 (+/-) NON-PADLOCK TYPE BREAKER LOCK-ON DEVICES AND INSTALL ON BRANCH BREAKERS AS DIRECTED IN FIELD (NIGHT LIGHTS, COMPUTERS, SECURITY, ETC.). PROVIDE DETAILED TYPEWRITTEN SCHEDULES FOR ALL PANELBOARDS CIRCUIT BREAKERS SHALL BE FURNISHED AS SCHEDULED ON THE DRAWINGS OR AS OTHERWISE REQUIRED BASED ON FIELD DETERMINATIONS.

PROVIDE ALL ELECTRICAL DISTRIBUTION RELATED EQUIPMENT WITH APPROPRIATELY BRACED BUSSING AND PROPERLY RATED BREAKERS, FUSES, ETC. FOR THE AVAILABLE FAULT CURRENTS.

IN EXISTING BUILDINGS WHERE FAULT CURRENT VALUES ARE NOT INDICATED ON DRAWINGS, COORDINATE WITH EXISTING "UPSTREAM" DISTRIBUTION EQUIPMENT PROVIDE EQUIPMENT AIC RATINGS TO MEET OR EXCEED SAME. FILL OUT PANELBOARD'S CIRCUIT DIRECTORY CARD UPON COMPLETION OF INSTALLATION WORK DIRECTORIES SHALL BE NEATLY TYPEWRITTEN ALL PANELBOARD DIRECTORIES SHALL INCLUDE THE ACTUAL ROOM NAMES/NUMBERS THAT ARE SELECTED FOR INTERIOR SIGNAGE/DESIGNATION.

# **SCOPE OF WORK**

- REUSE EXISTING 400A, 120/240V, 3-PHASE, ELECTRICAL SERVICE FROM THE UTILITY COMPANY FOR THE PROJECT
- SPACE REUSE EXISTING (1) 400A, 120/240V, 3-PHASE, 4-WIRE ELECTRICAL METER & CT CABINET.
- REUSE EXISTING (1) 400A.120/240V. 3-PHASE, 4-WIRE FUSED DISCONNECT SWITCH . REUSE EXISTING (1) 200A(MCB),120/240V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "A".
- REUSE EXISTING (1) 200A(MCB), 120/240V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "B ".
- REUSE EXISTING (1) 200A(M.L.O.), 120/240V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "C ". ALL NECESSARY EQUIPMENT, WIRING AND LIGHTING AS SHOWN ON PLANS. COORDINATE WITH GC FOR ANY LOW VOLTAGE WORK NECESSARY.

## **GENERAL LIGHTING NOTES**

- A. UPPER CASE LETTER NEXT TO LIGHT FIXTURE DENOTES FIXTURE TYPE AND LOWER CASE LETTER DENOTES SWITCHING SCHEME.
- B. ALL EMERGENCY FIXTURES SHALL BE CONNECTED TO AN UNSWITCHED HOT CONDUCTOR. SO THAT THEY ARE ENERGIZED ALL THE TIME.

# **EXISTING CONDITIONS NOTES**

#### STOP AND READ THE CONTRACTOR AND SUB-CONTRACTORS SHALL NOT INITIATE ANY WORK UNTIL EXISTING FIELD CONDITIONS ARE PROPERLY

VFRIFIFD FHIS SHALL HOLD TRUE FOR FIRST GENERATION AND 2ND GENERATION SPACES. WHEN DEMOLITION IS REQUIRED, THAT WILL BE PERMITTED TO EXPOSE CONDITIONS. THESE VERIFICATIONS SHALL INCLUDE BUT NOT LIMITED TO: DIMENSIONS BOTH HORIZONTALLY AND VERTICAL, ELECTRICAL SERVICE /PANELS LOCATION AND VOLTS/PHASE, LOCATION/OTY OF ROOF MOUNTED HVAC EQUIPMENT, CONFIRM THAT INTERIOR HVAC HUNG UNITS HAVE PROPER SUPPORT CONNECTIONS FOR EXISTING STRUCTURE FIRE SPRINKLER MAIN RUNS, TOILET ROOM DIMENSIONS, DOOR SWING FOR DOORS TO REMAIN AND ETC. IF NOT VERIFIED AND DISCOVERED AT A LATER TIME, THE CONTRACTOR SHALL REIMBURSE THE ARCHITECT FOR THE REDESIGN FEE. THIS DOES NOT

INCLUDE HIDDEN WORK I.E. PITCH OF SANITARY LINES, ACTUAL CONDITIONS OF EXISTING HVAC EQUIPMENT, STRUCTURAL COLUMNS/BEARING WALLS OR CONDITIONS OF GREASE INTERCEPTORS AND ETC.

## **ELECTRICAL NOTES**

- ELECTRICAL CONTRACTOR SHALL CONTRACTOR TO VERIFY THAT AL MATCHES THE DESCRIPTIONS AND AND SCHEDULES. IF DIFFERENT, N BIDDING, ORDERING, OR PROCEED
- ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ALL NEW ELECTRICAL WORK INDICATED. CONSTRUCTION SHALL BE IN ACCORDANCE WITH DRAWINGS AND APPLICABLE SPECIFICATIONS IF A PROBLEM IS ENCOUNTERED IN COMPLYING WITH THIS REQUIREMENT. CONTRACTOR SHALL NOTIFY THE OWNER OR HIS REPRESENTATIVE AS SOON AS POSSIBLE AFTER DISCOVERY OF THE PROBLEM AND SHALL NOT PROCEED WITH THAT 37. ALL ELECTRICAL OUTLETS SHALL BE AT 18" A.F.F. UNLESS NOTED PORTION OF THE WORK UNTIL OWNER HAS DIRECTED CORRECTIVE ACTION TO BE TAKEN.
- 38. ALL LIGHT SWITCHES TO BE AT 48" A.F.F. ELECTRICAL CONTRACTOR SHALL VISIT JOB SITE AND FAMILIARIZE HIMSELF 39. ALL ELECTRICAL WIRING SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL WITH ALL CONDITIONS AFFECTING ELECTRICAL AND COMMUNICATIONS CONTRACTOR. ALL ELECTRICAL WIRING FOR HVAC SYSTEM INCLUDING INSTALLATION AND MAKE PROVISIONS AS TO THE COST THEREOF. EXISTING CONTROLS, THERMOSTATS, POWER, ETC. SHALL BE THE RESPONSIBILITY OF CONDITIONS OF ELECTRICAL EQUIPMENT. LIGHT FIXTURES. ETC... THAT ARE THE ELECTRICAL CONTRACTOR. PART OF THE FINAL SYSTEM SHALL BE VERIFIED BY THE CONTRACTOR
- PRIOR TO SUBMITTING HIS BID. 40. BREAKER AND PANELS -- ALL CURRENT CARRYING BUSSES SHALL BE COPPER. ALL GROUND BUS BARS SHALL BE COPPER. PANEL BOARD ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2017 EDITION ENCLOSURES SHALL BE FURNISHED WITHOUT PRE-PUNCHED CONCENTRIC OF THE NATIONAL ELECTRIC CODE AND ALL CODES AND ORDINANCES OF HOLES. A.I.C. RATINGS SHALL BE AS INDICATED ON PANEL BOARD THE AUTHORITY HAVING JURISDICTION SCHEDULES.
- DO NOT SCALE THE ELECTRICAL DRAWINGS. REFER TO ARCHITECTURAL PLANS AND ELEVATIONS FOR EXACT LOCATION FOR ALL EQUIPMENT. CONFIRM WITH OWNER'S REPRESENTATIVE.
- ALL ELECTRICAL NOT BEING REUSED MUST BE REMOVED IN ITS ENTIRETY. ALL CONDUIT IN OR UNDERGROUND OR IN CONCRETE MUST BE RIGID GALVANIZED STEEL.
- CIRCUIT BREAKERS AND PANELS TO BE BOLT ON TYPE
- 10. ALL EQUIPMENT SHALL BE APPROVED BY UL OR OTHER NATIONALLY RECOGNIZED TESTING COMPANY. 1. ALL RECEPTACLES SHALL BE GROUNDED AS REQUIRED BY NEC 250.146
- 12. SUBMIT SERVICE ENTRANCE EQUIPMENT FOR SEPARATE APPROVAL.
- 13. ALL LOW VOLTAGE MUST BE IN CONDUIT TO ABOVE THE DROP CEILING. BRIDAL RINGS OR "J" HOOKS REQUIRED.
- 14. SEPARATE PERMITS ARE REQUIRED FOR ALL LOW VOLTAGE SUCH AS TELEPHONE, DATA, THERMOSTAT, MUSIC, ALARMS ETC.
- 15. SEPARATE PERMIT REQUIRED FOR SIGNAGE.
- GENERAL CONTRACTORS IS REQUIRED.
- 8. MINIMUM WIRE SIZE SHALL BE #12 A.W.G. EXCLUDING CONTROL WIRING. ALL CONDUCTORS SHALL BE COPPER AND UNLESS OTHERWISE NOTED THHN |50. CONSTRUCTION "AS BUILT" DRAWINGS AND DOCUMENTS SHALL BE INSULATION. PROVIDED TO THE OWNER WITHIN 30 DAYS AFTER THE DATE OF ACCEPTANCE. PROVIDE A COPY TO LL.
- 19. OUTLET BOXES SHALL BE PRESSED STEEL IN DRY LOCATIONS, PLASTIC AND CAST ALLOY WITH THREADED HUBS IN WET OR DAMP LOCATIONS, AND OPERATION MANUALS AND MAINTENANCE MANUALS SHALL BE PROVIDED TO SPECIAL ENCLOSURES FOR OTHER CLASSIFIED AREAS. THE BUILDING OWNER.
- WORKING ORDER.
- REQUIRED BY THE N.E.C. OR LOCAL CODES.

APPLICABLE

- 23. ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR IN A FIRST CLASS WORKMANLIKE MANNER. THE COMPLETED SYSTEM SHALL 55. ALL EQUIPMENT, DEVICES AND FIXTURES SHALL BE GROUNDED BE FULLY OPERATIVE AND ACCEPTED BY ENGINEER/ARCHITECT COMPLIANCE WITH NEC AND UL REQUIREMENTS.
- 24. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID INTERFERENCE WITH THE PROGRESS OF CONSTRUCTION.
- 25. ELECTRICAL CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN ONE LIGHTS, SHOW WINDOW LIGHTS, SHOW WINDOW RECEPTACLES AND YEAR FROM DATE THAT CERTIFICATE OF OCCUPANCY IS ISSUED. WARRANTY SHALL BE PROVIDED IN WRITING. PROVIDE COPY TO LL.
- PHASE OF THE INSTALLATION WHICH MAY HAVE BEEN DAMAGED THEREBY.
- WORK.
- PRIOR TO BEGINNING WORK OR ORDERING EQUIPMENT.
- 29. THE ELECTRICAL INSTALLATION SHALL MEET ALL STANDARD REQUIREMENTS APPEARANCE. OF POWER AND TELEPHONE COMPANIES. 30. CONTRACTOR SHALL COORDINATE WITH MECHANICAL DRAWINGS AND
- PROVIDE ALL NECESSARY CONTROL WIRING.
- 31. ALL CIRCUIT BREAKERS FEEDING MECHANICAL EQUIPMENT SHALL BE HACR TYPE CIRCUIT BREAKERS.
- 32. PROVIDE AND INSTALL CONDUIT, CONDUCTORS, PULL WIRES, BOXES, COVER PLATES, DEVICES, ETC. FOR ALL OUTLETS AS INDICATE
- THEREOF, SHALL BE NEW AND SUCH AS APPEAR ON THE ULLIST OF

ELECTI	
SYMBOL	DESCRIPTION
	EXHAUST FAN
	COMBINATION EXHAUST FAN/LIGHT (REFER TO MECHANICAL PLANS)
Ś	SPEAKERS @ CEILING
J	JUNCTION BOX
SD	CEILING MOUNTED SMOKE DETECTOR 110V., INTERCONNECTED W/ BACKUP. SMOKE DETECTOR SHALL COMPLY WITH NFPA 72, AND FBC
	BATTERY BACK UP EXIT LIGHT
QQ	BATTERY BACK UP EMERGENCY LIGHT
\$	WALL SWITCH (SINGLE, DOUBLE)
\$3	WALL SWITCH (3 WAY, 4 WAY)
\$ <sub>1</sub>	WALL SWITCH (TIMER)
\$ <sub>0</sub>	DIMMER WALL SWITCH
\$ <sub>os</sub>	OCCUPANCY SENSOR WALL SWITCH
<del>0</del>	SINGLE RECEPTACLE
€	DUPLEX RECEPTACLE
<del>_</del>	DUPLEX RECEPTACLE, 46" TO AFF AT KITCHEN, BATHS AND TOPS
۲	230 VOLT RECEPTACLE
- +	QUADRUPLEX RECEPTACLE
<b>O</b>	FLOOR MOUNTED. FLUSH DUPLEX RECEPTACLE
	FLOOR MOUNTED. FLUSH QUAD. RECEPTACLE
	FLOOR MOUNTED. FLUSH 230 VOLT RECEPTACLE

REVIEW ALL DRAWINGS OF THIS SET.	
EQUIPMENT SHOWN AS EXISTING SPECIFICATIONS SHOWN ON DRAWINGS IOTIFY ARCHITECT/ENGINEER BEFORE ING WITH WORK.	

- 7. ELECTRICIAN MUST BE ON SITE FOR ALL INSPECTIONS.
- ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM AND PROVIDE ALL REQUIREMENTS NECESSARY FOR EQUIPMENT TO BE PLACED IN PROPER
- 27. ALL REQUIRED INSURANCE SHALL BE PROVIDED FOR PROTECTION AGAINST PUBLIC LIABILITY AND PROPERTY DAMAGE FOR THE DURATION OF THE
- 28. CONTRACTOR SHALL PAY FOR ALL PERMITS. FEES. INSPECTIONS AND TESTING. CONTRACTOR TO OBTAIN PERMIT AND APPROVED SUBMITTALS
- 33. MATERIALS, PRODUCTS, AND EQUIPMENT, INCLUDING ALL COMPONENTS
- APPROVED ITEMS AND SHALL MEET OR EXCEED THE REQUIREMENTS OF

- N.E.C. NEMA, AND IECE
- 34. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OR CUT SHEETS OF LIGHTING FIXTURES, SWITCHES, AND OTHER ELECTRICAL ITEMS FOR APPROVAL BY ENGINEER/ARCHITECT.
- 35. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING. PATCHING AND FIRED CAULKING REQUIRED OF HIS WORK.
- 36. ELECTRICAL CONTRACTOR SHALL LABEL ALL PANELS W/TYPE WRITTEN DIRECTORIES.
- OTHERWISE, AND VERTICALLY MOUNTED.
- . DISCONNECT SWITCHES SHALL BE H.P. RATED, GENERAL DUTY, QUICK-MAKE, QUICK-BREAK ENCLOSURES AS REQUIRED BY EXPOSURE. 42. MOTOR STARTERS SHALL BE MANUAL OR MAGNETIC, WITH OVERLOAD
- RELAYS IN EACH HOT LEG 43. THE TERM "PROVIDE" USED IN THE CONSTRUCTION DOCUMENTS AND SPECIFICATIONS INDICATES THE CONTRACT SHALL FURNISH AND INSTALL.
- 44. CONTRACTOR SHALL CONFIRM WITH ANY AND ALL REQUIREMENTS SUCH AS: LUG SIZE RESTRICTIONS CONDUIT ENTRY TRANSFORMER SIZE SCHEDULED DOWN TIME FOR OWNERS CONFIRMATION, ETC. ANY CONFLICTS SHALL BE BROUGHT TO ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH ANY WORK
- 45. VOLTAGE DROP FOR ALL BRANCH CONDUCTORS SHALL NOT EXCEED 3% WHERE VOLTAGE DROP EXCEEDS 3%, CONTRACTOR SHALL INCREASE SIZE OF CONDUCTORS.
- 46. CONTRACTOR SHALL PROVIDE GFI TYPE BREAKER FOR ALL EXTERIOR 120V CIRCUITS OR GFI PROTECTION -- FOR THE WHOLE CIRCUIT. 47. GAS PIPING SHALL BE BONDED.
- 48. ELECTRICAL CONTRACTOR SHALL COORDINATE SERVICE ENTRY WITH 16. PRIOR TO ANY CONSTRUCTION WORK BEGINNING AN ON-SITE MEETING WITH SERVICE PROVIDER PRIOR TO DETERMINING EXACT LOCATION OF THE METER BOX IN ORDER TO AVOID DISCREPANCIES BETWEEN DRAWINGS AND JOB CONDITIONS
  - ALL OUTDOOR EQUIPMENT SHALL BE WEATHERPROOF.
- 20. IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF |52. ABSOLUTELY NO FLEXIBLE CONDUIT IS PERMITTED IN DEMISING WAL CONSTRUCTION. THE CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL FLEXIBLE CONDUIT IS PERMITTED FOR SHORT FINAL CONNECTIONS ONLY (6'-0" OR LESS). 53. EXPOSED CONDUIT SHALL BE INSTALLED IN STRAIGHT LINES, PARA
- IN RIGHT ANGLES TO THE BUIDING STRUCTURE. DO NOT LOOP EXC 21. ELECTRICAL SYSTEM SHALL BE COMPLETE AND EFFECTIVELY GROUNDED AS FLEXIBLE CONDUIT IN CEILING SPACE OR WALL CAVITY. NO CONDUIT TO BE SUPPORTED FROM THE ROOF DECK
- 22. ALL MATERIALS SHALL BE NEW AND BEAR UNDERWRITERS' LABELS WHERE 🛛 🛛 54. CABLE TYPES AC AND NM CABLES ARE NOT ACCEPTABLE. TYPE MC CABLE, ELECTRIC METALLIC TUBING (EMT) AND RIGID GALVANIZED CONDUIT ARE
  - 56. ALL NEW PANELS TO BE UL LABELED WITH BOLT-ON TYPE CIRCUIT BREAKERS. 57. 7-DAY 24-HOUR TIME CLOCK IS REQUIRED TO CONTROL STOREFRONT ENTRY
  - STOREFRONT SIGNAGE. ILLUMINATED STOREFRONT SIGNS MUST REMAIN LIT DURING ALL MALL BUSINESS HOURS.
- 26. CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ADDITIONAL CHARGE AND SHALL INCLUDE REPLACEMENT OR REPAIR OF ANY OTHER 658. TENANT IS REQUIRED TO MAKE A FIELD SURVEY OF THE EXISTING ELECTRICAL SERVICE TO ENSURE THAT THE TOTAL CONNECTED LOAD DOES NOT EXCEED THE ELECTRIC SERVICE. ANY/ALL MODIFICATIONS OR UPGRADES NEEDED ARE SUBJECT TO LANDLORD'S PRIOR APPROVAL AND WILL BE COMPLETED BY TENANT/TENANT'S GC AT TENANT'S SOLE EXPENSE
  - . ALL ELECTRICAL PANELS TO BE MOUNTED ON PLYWOOD BACKER BOARD. 60. PANEL PHASE LOADS TO BE BALANCED WITHIN 10%.
  - ELECTRICAL PANELS MAY NOT BE RECESSED IN DEMISING PARTITIONS. SURFACE MOUNT OR FULL FUR OUT WALL TO ACHIEVE FLUSH FINAL

COORDINATE ALL CONCRETE TRENCHING/CORING TO ENSURE THAT ANY INDER SLAB UTILITIES. ETC. ARE NOT DAMAGED DURING FLOOR CUT. ANY AMAGE TO BE REPAIRED AT TENANT'S EXPENSE. PRIOR APPROVAL AND ORDINATION WITH PROPERTY MANAGEMENT IS REQUIRED FOR ALL ONCRETE CUTTING.

	<b>P</b> <sub>cl</sub>	CEILING MOUNTED DU	JPLEX RECEPTACLE
		ELECTRICAL PANEL	
	2-	TELEVISION OUTLET	
		TELEPHONE OUTLET	
		TELEPHONE/DATA OU	ITLET
BATT.		DATA OUTLET	
905.2.		FLOOR MTD. FLUSH T	ELEPHONE/DATA OUTLET
		QUAD. DATA OUTLET	RJ45
		30A/240V NON FUSED	DISCONNECT SWITCH
		60A/240V NON FUSED	DISCONNECT SWITCH
		100A/240V NON FUSE	D DISCONNECT SWITCH
		200A/240V NON FUSE	D DISCONNECT SWITCH
	ABBREVIAT	IONS:	
	ABOVE FINIS	SH FLOOR= A.F.F.	BELOW COUNTER= BC
	COUNTER TO	DP LEVEL= C	PUSH BUTTON= PB
	GROUND FAI	ULT INTERRUPTER= GFCI	UNDER CABINET= UC
	VERIFY PRIC	OR TO INSTALL= VH	VAPOR PROOF= VP
	WEATHER PI	ROOF= WP	SALVAGED = S
	RECIRCULAT	ING PUMP=RCP	ELECTRICAL CONTRACTOR = E.C
	EXHAUST FA	N = EF	AUTHORITY HAVING JURISDICTION = A. H.J

LIGHTING TIMER CONTROL = LTC

ELECTRIC UNIT HEATER = EUH

POOL UNIT = PU

DOAS UNIT = DU

BATHROOM EXHAUST FAN = BEF

REMOTE TERMINAL UNIT = RTU

POOL EXHAUST FAN = PEF

WATER HEATER = WH

![](_page_8_Figure_90.jpeg)

	TYPE	DESCRIPTION	MANUFACTURER	CATALOG N
$\square$	А	2'X4' RECESSED LED LAY-IN	ORACLE LIGHTING	24-ODVH-LED-
	A1	2X2 RECESSED LED TROFFER	ORACLE LIGHTING	TBD
$\odot$	В	DECORATIVE PENDANT - Ø15" OPAL DIFFUSER	ACCESS	50180-BS/OPL
$\bigcirc$	D	CIRCULAR LED RING PENDANT LED Ø24"	COMMERCIAL LIGHTING	18"-22W-1495-9
$\bigcirc$	D1	CIRCULAR LED RING PENDANT LED Ø37"	COMMERCIAL LIGHTING	32"-88W-1495-9
<u> </u>	F	TRACK LIGHTING	COMMERCIAL LIGHTING	LED TRACK HE
$\bigcirc$	I	PENDANT LED HIGH BAY @13'-0" AFF.	LITHONIA LIGHTING	JEBL 12L 40K 8
<u> </u>	Y1	EMERGENCY LIGHT	EXITRONIX	LED-95-WH
<b>*</b>	X2	EXIT SIGN-EMERGENCY LIGHT COMBO	LITHONIA	#EML2L-120V
$\odot$	Х3	EXIT SIGN-EMERGENCY LIGHT COMBO	EXITRONIX	VLED-EL90
\$⊤	т	TIMER WALL SWITCH	NTERMATIC	ST700W
\$ <sub>os</sub>	os	OCCUPANCY WALL SWITCH	NTERMATIC	IOS-DDR-WH
LTC	LTC	LIGHTING TIMER CONTROL	COOPER LIGHTING	LK16, LTEKEE
65	-	CEILING OCCUPANCY SENSOR	LEVITON/LEGRAND /APPROVED MAKES	02C10-UDW/C
"E" DE	ENOTES	EXISTING LIGHT FIXTURE		

LIGHTING SPECIFICATION NOTES:

1- FOR LIGHT FIXTURES DETAILS & SPECIFICATIONS, SEE ELECTRICAL PLANS. 3- ALL FIXTURES TO BE PURCHASED FROM REGENCY LIGTHING:

ELECTRICAL LIGHTING PLAN KEYED WORK NOTES:

CONNECT ALL EMERGENCY EGRESS FIXTURE & EXIT SIGNS TO THE NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF ALL SWITCHING AND CONTROLS AS PER STATE AND LOCAL CODES.

E,C SHALL COORDINATE EXACT LOCATION OF DIMMER SWITCH BANK WITH OWNER/ARCHITECT.

E.C TO COORDINATE THE BUILDING SIGNAGE CONNECTION REQUIREMENTS WITH SIGN VENDOR. BASE BID ACCORDINGLY.

PROVIDE SHOW WINDOW RECEPTACLE AS PER NEC 210.62. VERIFY EXACT LOCATION WITH ARCHITECT.

E LIGHTING NEAR ELECTRICAL PANELS SHALL NOT BE CONTROLLED BY ANY AUTOMATIC MEANS AND SHALL BE COMPLIED AS PER NEC 110.26(D).

EXISTING LIGHT FIXTURE IN THIS AREA DENOTED BY (E) SHALL REMAIN AS IT IS. E.C. SHALL VERIFY OPERABLE CONDITION OF THE EXISTING LIGHT FIXTURE AND CONTROLS IN FIELD. PROVIDE NEW CONTROLS AS SPECIFIED ON DRAWINGS IF FOUND INOPERABLE.

ELECTRICAL JUNCTION BOX PROVISION IN THIS AREA. E.C. SHALL COORDINATE WITH THE OWNER/ARCHITECT FOR THE EXACT REQUIREMENTS FOR THE LIGHTING FIXTURES PRIOR TO ROUGH-IN. BASE BID ACCORDINGLY.

 $\widehat{(H)}$  LIGHTING CONTROL IS NOT REQUIRED IN THIS AREA AS PER IECC C405.2

ELECTRICAL LIGHTING PLAN GENERAL NOTES:

1. AVERAGE 1 FOOT CANDELA FOR EMERGENCY ILLUMINATION TO BE ARCHIVED NEAR POOL AREA PER ISPC CODE 321.3.

![](_page_9_Figure_11.jpeg)

ELECTRICAL LIGHTING PLAN KEYED WORK NOTES:

CONNECT ALL EMERGENCY EGRESS FIXTURE & EXIT SIGNS TO THE NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF ALL SWITCHING AND CONTROLS AS PER STATE AND LOCAL CODES.

B LIGHTING CONTROL IS NOT REQUIRED IN THIS AREA AS PER IECC C405.2

C LIGHTING CONTROL PANEL LOCATION. E.C TO COORDINATE FINAL LOCATION WITH ARCHITECT/ OWNER.

ELECTRICAL JUNCTION BOX PROVISION IN THIS AREA. E.C. SHALL COORDINATE WITH THE OWNER/ARCHITECT FOR THE EXACT REQUIREMENTS FOR THE LIGHTING FIXTURES AND PROVIDE APPROPRIATE CONTROL PRIOR TO ROUGH-IN. BASE BID ACCORDINGLY.

ELECTRICAL LIGHTING PLAN GENERAL NOTES: 1. AVERAGE 1 FOOT CANDELA FOR EMERGENCY ILLUMINATION TO BE ARCHIVED NEAR POOL AREA PER ISPC CODE 321.3.

![](_page_10_Figure_6.jpeg)

![](_page_11_Figure_0.jpeg)

ELECTRICAL ROOF PLAN KEYED WORK NOTES: DELECTRICAL CONTRACTOR SHALL COORDINATE FOR EXACT LOCATION OF MECHANICAL EQUIPMENTS WITH MECHANICAL DRAWINGS.

ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.

3 INTERCONNECT PEF-1(N) & PEF-2(N) WITH DU-1(N). COORDINATE WITH MECHANICAL CONTRACTOR.

INTERCONNECT EXHAUST FAN EF-5(N) with AHU-1(N) or provide 24HR timer control. Coordinate with mechanical contractor.

EXISTING MECHANICAL EQUIPMENT WITH ITS ELECTRICAL CONNECTION AND ELECTRICAL FIXTURE TO REMAIN. E.C. SHALL VERIFY OPERABLE CONDITION OF ELECTRICAL CONNECTION AND ELECTRICAL FIXTURE ON FIELD. REPLACE IF INOPERABLE. BASE BID ACCORDINGLY. E.C. SHALL COORDINATE WITH LANDLORD FOR THE EXACT LOCATION OF RTU AND ITS ELECTRICAL CONNECTIONS ON FIELD.

EXISTING ROOF OUTLETS SHALL REMAIN WITH ITS BRANCH CIRCUITS. E.C. SHALL COORDINATE IN FIELD THE OPERABLE CONDITIONS OF THE SAME AND PROVIDE NEW IF FOUND INOPERABLE AS SHOWN ON THE DRAWINGS. BASE BID ACCORDINGLY.

A. E.C. SHALL COORDINATE WITH GC/POOL DRAWINGS FOR POOL REQUIREMENTS.

![](_page_12_Picture_7.jpeg)

# PANEL SCHEDULE:

DANEL																
PANEL:		<u> </u>												MOUNTING: RECESSED		
	<b>`</b> _						-									
120/240		VOLIS,	3	PF	IASE,		4	WIRE						LOCATION: ELECTRICAL/FIRE R	MOOM	
			1													
MAIN CB		200A	MLO:	NA		BUS:	EXISTING	MIN,						FED FROM: EXISTING SERVICE		
NOTE: L : LI	GHTING, H	: HVAC LOAD, M :	MOTOR LOAD	, R : RECEPTACLES, O : (		C. (TYPICAL)	[		/			1		I	<del>.                                    </del>	
СКТ NO.	TRIP AMPS	[ [	DESCRIPTION C	OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	A	R PHASE (K) B	VA)   C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1					н	0.43		1.02				0.59	н			2
3	50-3P	RTU-1(E)			н	0.35	3#-8 , #10G, 3/4"C		0.35		3#10, #10G, 3/4"C		н	RTU-2(E)	30-3P	4
5	1				Н	0.35				0.80		0.45	н	1		6
7		HIGH LEG						0.00						HIGH LEG		8
9	20	BABY STATION, N ROOM LGT CKT	/IEN'S RET ROC	OM, WOMEN'S REST	L	0.40	2#12, #12G, 3/4"C		0.42		2#12, #12G, 3/4"C	0.02	м	EF-5(N)	20	10
11	20	ELECTRICAL/FIRE	ROOM LGT CK	T	L	0.50	2#12, #12G, 3/4"C			1.22	2#12, #12G, 3/4"C	0.72	R	ROOF OUTLET	20	12
13		HIGH LEG						0.00						HIGH LEG		14
15	20	BEVERAGE FRIDG	ĴΕ		E	0.15	2#12, #12G, 3/4"C		0.70		2#12, #12G, 3/4"C	0.55	L	STAIRCASE, STAFF AREA, STORAGE LGT CKT	20	16
17	20	BEVERAGE FRIDG	ĴΕ		E	0.15	2#12, #12G, 3/4"C			1.88	2#12, #12G, 3/4"C	1.73	E	COFFE MACHINE	20	18
19		HIGH LEG						0.00						HIGH LEG		20
21	20	TV'S			R	0.60	2#12, #12G, 3/4"C		1.19		2#12, #12G, 3/4"C	0.59	L	LOBBY/ RECEPTION, VIEWING AREA LGT CKT	20	22
23	20	LOBBY/RECEPTIC	N AREA RECEP	TACLE	R	0.72	2#12, #12G, 3/4"C			1.17	2#12, #12G, 3/4"C	0.45	L	CHANGING ROOM LGT CKT	20	24
25		HIGH LEG						0.00						HIGH LEG		14
27	20	HAIR DRYER			E	1.00	2#12, #12G, 3/4"C		1.55		2#12, #12G, 3/4"C	0.55	E	DRINKING FOUNTAIN	20	28
29	20	HAIR DRYER			E	1.00	2#12, #12G, 3/4"C			1.55	2#12, #12G, 3/4"C	0.55	E	DRINKING FOUNTAIN	20	30
31		HIGH LEG						0.00						HIGH LEG		32
33	20	HAIR DRYER			E	1.00	2#12, #12G, 3/4"C		1.36		2#12, #12G, 3/4"C	0.36	R	WOMEN'S REST ROOM, MEN'S REST ROOM	20	34
35	20	HAIR DRYER			E	1.00	2#12, #12G, 3/4"C			1.18	2#12, #12G, 3/4"C	0.18	R	ELECTRICAL ROOM RECEPTACLE	20	36
37		HIGH LEG						0.00						HIGH LEG		38
39	20	HAIR DRYER			E	1.00	2#12, #12G, 3/4"C		1.36		2#12, #12G, 3/4"C	0.36	R	LOBBY AREA RECEPTACLE	20	40
41	20	SPARE								0.36	2#12, #12G, 3/4"C	0.36	R	SECOND FLOOR STORE ROOM	20	42
			TOTAL	CONNECTED LOAD (KV/	4) 			1.02	4.21	6.62						

PANEL:	B(E)	$\mathbf{i}$												MOUNTING:	RECESSED		
															•		
120/240		VOLTS,	3	PH/	ASE,		4	WIRE						LOCATION:	ELECTRICAL/FIRE F	00M	
	•		•												•		
MAIN CB		200A	MLO:	NA		BUS:	EXISTING	MIN,						FED FROM	EXISTING SERVICE		
NOTE: L : LIC	GHTING, H	HVAC LOAD, M : I	MOTOR LOAD,	R : RECEPTACLES, O : O	THER/MISC	. (TYPICAL)		-									
СКТ NO.	TRIP AMPS	D	ESCRIPTION O	FLOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PE	R PHASE (K\ B	/A)	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION	I OF LOAD	TRIP AMPS	CKT NO.
1		HIGHLEG										. ,		HIGHLEG			2
3	20	STAFF AREA RECE	PTACLE		R	0.18	2#12. #12G. 3/4"C	0.00	1.38		2#12. #12G. 3/4"C	1.20	R	SHOW WINDOW RECEPT	ACLE	20	4
5	20	GARBARE DISPOS	SAL		E	0.76	2#12, #12G, 3/4"C			1.96	2#12, #12G, 3/4"C	1.20	R	SHOW WINDOW RECEPT	ACLE	20	6
7		HIGH LEG						0.00					0				8
9	20	REFRIGERATOR			E	0.69	2#12, #12G, 3/4"C		0.69		2#12, #12G, 3/4"C		0	PANEL C		100-3P	10
11	20	BUILDING SIGNAG	GE		L	0.60	2#12, #12G, 3/4"C			0.60			0	1			12
13		HIGH LEG					2#12, #12G, 3/4"C	0.00						HIGH LEG			14
15	20	POOL AREA LIGHT	TING		L	0.57	2#12, #12G, 3/4"C		1.00		2#12, #12G, 3/4"C	0.43	L	LOBBY/ RECEPTION, VIEV	WING AREA LGT CKT	20	16
17	20	POOL AREA LIGHT	TING		L	0.57	2#8, #10G, 3/4"C			0.92	2#12, #12G, 3/4"C	0.35	L	CHANGING ROOM LGT C	ЖТ	20	18
19		HIGH LEG						0.00						HIGH LEG			20
21	20	SWIMSUIT DRYER	8		E	1.00	2#12, #12G, 3/4"C		2.02		2#12, #12G, 3/4"C	1.02	М	PEF-1(N)		20	22
23	20	SWIMSUIT DRYER	8		E	1.00	2#12, #12G, 3/4"C			2.02	2#12, #12G, 3/4"C	1.02	М	PEF-2(N)		20	24
25	20	HIGH LEG						7.32				7.32	Н				<b>2</b> 6
27	20	PUMP ROOM & A	CID ROOM		R	0.36	2#12, #12G, 3/4"C		7.68		3#6 , #10G, 3/4"C	7.32	Н	DU-1(N)		60-3P	28
29	20	FACP(EXISTING)			0	0.50	EXISTING			7.82		7.32	Н				30
31		HIGH LEG						0.00						HIGH LEG			32
33	20	POOL REST ROOM	/		R	0.18	2#12, #12G, 3/4"C		1.92		2#10 #10G 3///"C	1.74	Н			20.20	34
35	20	MOTORIZED DAM	1PER		М	0.01	2#12, #12G, 3/4"C			1.75	2#10, #100, 5/4 C	1.74	Н			JU-ZP	36
37		HIGH LEG						0.00						HIGH LEG			38
39	20	AHU-1(N)			Н	1.48	2#12, #12G, 3/4"C		1.50		2#12, #12G, 3/4"C	0.02	М	EF-2(N)		20	40
41	20	EF-4(N)			М	0.16	2#12, #12G, 3/4"C			0.23	2#12, #12G, 3/4"C	0.06	М	EF-3(N)		20	42
			TOTAL C	ONNECTED LOAD (KVA	)			7.32	16.19	15.29							

PANEL:	C (E)													MOUNTING:	RECESSEE	)	
													-				
120/240		VOLTS,	3	F	PHASE,		4	WIRE						LOCATION:	POOL EQ	JIPMENT ROOM	
MAIN CB		NA	MLO:	200A		BUS:	EXISTING	MIN,						FED FROM:	PANEL B(	E)	
NOTE: L : LI	GHTING, H	: HVAC LOAD, M :	MOTOR LOAD, R :	RECEPTACLES, O	: OTHER/M	ISC. (TYPIC	AL)										
	TRIP				LOAD	LOAD	MINIMUM BRANCH	PE	R PHASE (K\	/A)	MINIMUM BRANCH	LOAD	LOAD	DESCRIPTIO		TRIP	
CKTNO.	AMPS				TYPE	(KVA)	CIRCUIT	A	В	С	CIRCUIT	(KVA)	ТҮРЕ	DESCRIPTIO	IN OF LOAD	AMPS	CKT NO.
1					0	3.88		3.88					SP/	ACE			2
2	40-2P	TRANSFORMER	FOR PUMP(EXISTIN	G)	0	2 9 9	EXISTING		2.99				SP/	ARE		20	4A
5					0	5.00			5.00				SP/	ARE		20	4B
5		HIGH LEG								0.00			HIC	GH LEG			6
7	20-2P	PUMP RELAY(EX	ISTING)		о	1.92	EXISTING	2.44			2#12, #12G, 3/4"C	0.52	L PU RO	MP ROOM, ACID R OM LGT CKT & EF	OON, POOL RES -1(N)	T 20	8
9					0	1.92			1.92				SP/	ARE		20	10
11		HIGH LEG								0.00			HIG	GH LEG			12
13	20.20	SALT GENI/EVISTI			0	1.92	EVISTING	1.92					SPI	PARE		20	14
15	20-2P	SALT GEN(EXIST			0	1.92	EXISTING		2.10	١	EXISTING	0.18	E WA	ATER HEATER(EXIS	TING)	20	16
17		HIGH LEG								0.00			HIG	GH LEG			18
19	40.20	DI IMD 2/EVISTIN	C)		0	3.88	EVISTING	4.06			EXISTING	0.18	E PO	OL HEATER(EXISTII	NG)	20	20
21	40-28		0)		0	3.88	EXISTING		3.88				SP/	ARE		20	22
23		HIGH LEG								0.00			HIG	GH LEG			24
25	20-20	SALT GEN/EVIST			0	1.92	EXISTING	3.84				1.92	0			20	26
27					0	1.92			3.84		EXISTING	1.92	0 220	D PUMP(EXISTING)		20	28
29		HIGH LEG								1.92		1.92	0			20	30
			TOTAL CONNEC	TED LOAD (KVA)				16.14	15.62	1.92							
-								-		-							

# EQUIPMENT SCHEDULE:

ITEM NO.	DESCRIPTION	VOLTAGE	PHASE	AMPS	kW
16	HAIR DRYER HOLDER	115	1	8.70	1.00
17	DRINKING FOUNTAIN	115	1	4.78	0.55
18	SWIMSUIT DRYER	115	1	8.60	1.00
23	COFFEE MACHINE	115	1	15.00	1.73
24	BEVERAGE FRIDGE	115	1	1.30	0.15
27	GARBAGE DISPOSAL	120	1	6.30	0.76
28	REFRIGERATOR	115	1	5.97	0.69
37	TV	115	1	4.78	0.55

# LIGHTING CONTROL PANEL SCHEDULE:

PANEL #	CKT #	RELAY	DESCRIPTION	LIGHT TYPE	SWITCH
А	22	1	RECEPTION, VIEWING AREA	D,D1,B	DIMMER SWITCH
А	24	2	CHANGING ROOMS	A,A1	DIMMER SWITCH
А	9	3	BABY STATION	А	DIMMER SWITCH
В	15	4	SAF-T-SWIN POOL	I	DIMMER SWITCH
В	16	5	RECEPTION, VIEWING AREA	D,D1,B,F	DIMMER SWITCH
В	17	6	SAF-T-SWIN POOL		DIMMER SWITCH
В	18	7	CHANGING ROOMS	A	DIMMER SWITCH

# PANEL GENERAL NOTES:

- 1. ALL CIRCUITING IS SHOWN FOR PANEL"A", "B" & "C" FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY CIRCUITING OF THE EXISTING DEVICES ON FIELD AND INFORM ENGINEER FOR ANY DISCREPANCIES.
- 2. ELECTRICAL CONTRACTOR TO VERIFY THE EXACT PANEL SIZES AND INCOMING FEEDER SIZE.
- 3. ELECTRICAL CONTRACTOR SHALL VERIFY EXACT CIRCUIT NUMBER & BREAKER SIZE OF EXISTING DEVICES IN FIELD.
- 4. E.C. SHALL PROVIDE NEW CIRCUIT BREAKERS IN PLACE OF EXISTING CIRCUIT BREAKERS WHEREVER NECESSARY TO BE IN LINE WITH THE PANEL SCHEDULE. ALSO CHECK COMPATIBILITY OF NEWLY ADDED BREAKERS WITH EXISTING PANEL BEFORE PURCHASE
- 5. E.C. SHALL VERIFY THE EXISTING EQUIPMENT LOAD & RATINGS IN FIELD AND ACCORDINGLY CONSIDER THE ELECTRICAL LOAD IN PANEL BOARD SCHEDULE.
- 6. POOL PUMPS TO HAVE GFCI PROTECTION.
- ALL THE POOL EQUIPMENT CIRCUITING SHOWN IN THE PANEL "C" ARE FOR THE REFERENCE PURPOSE ONLY. ELECTRICAL CONTRACTOR SHALL VERIFY THE EXACT POWER PROVISIONS FOR THE POOL EQUIPMENT ROOM WITH THE VENDOR PRIOR TO ROUGH-IN. BASE BID ACCORDINGLY.

# PANEL KEYED NOTE:

EXISTING PANEL'S "A" & "B" VISUAL REPRESENTATION MAY NOT MATCH WITH THE SITE CONDITIONS HOWEVER CIRCUITS NUMBERS ARE AS PER THE SITE CONDITIONS. CONTRACTOR TO CIRCUIT AS PER THE CIRCUIT # PROVIDED ON THE PLANS TO THE SAME CIRCUIT # IN THE EXISTING PANEL. FIELD VERIFY CIRCUIT DETAILS BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY. INFORM ENGINEER IN CASE OF ANY DISCREPANCIES.

![](_page_13_Picture_18.jpeg)

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REVISIONS DATES:
ISSUE DATE: PROJECT #:
CHECKED BY: <u>NYE</u> CHECKED BY: <u>NYE</u> PANEL SCHEDULE
E-7

SCALE

NTS

PANLE SCHEDULE

# **PLUMBING NOTES**

### GENERAL

A) THE GENERAL CONDITIONS OF THE GENERAL SPECIFICATIONS. ALONG WITH ALL APPLICABLE INSTRUCTIONS TO BIDDERS SHALL FORM A PART OF THIS SECTION OF THE SPE B) REFERENCE IS MADE TO REQUISITES FOR BIDDERS AND CONTRACTORS UNDER OTHER SECTIONS OF THESE SPECIFICATIONS. WHICH SHALL BE CONSIDERED BINDING. UNLE NOTED UNDER THIS SECTION.

#### <u>SCOPE</u>

EACH CONTRACTOR SHALL THOROUGHLY ACQUAINT HIMSELF WITH THE CONSTRUCTION DETAILS, BOTH AS ON TENANT CONSTRUCTION DRAWINGS AND LANDLORD'S AS REFE BEFORE SUBMITTING HIS BID AS NO ALLOWANCES WILL BE MADE BECAUSE OF THE CONTRACTOR'S UNFAMILIARITY WITH THESE DETAILS. ALL PERFORMANCE OF CONSTRUCTION REQUIRED BY THE PACE OF THE GENERAL CONSTRUCTION. INSPECTION OF SITE ALL PROPOSALS SHALL PRECLUDE THAT CONTRACTOR IS FAMILIAR WITH JOB SITE, CONDITION LOCATIONS AND THE LACK OF SPECIFIC INFORMATION ON THE DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF ANY RESPONSIBILITY.

#### PERMITS

ALL PERMITS AND LICENSES NECESSARY FOR THE PROPER EXECUTION OF THE WORK SHALL BE SECURED AND PAID FOR BY THE SUBCONTRACTOR INVOLVED.

### CODE REQUIREMENTS

ALL WORK UNDER THIS CONTRACT SHALL COMPLY WITH THE PROVISIONS OF THE SPECIFICATIONS, DRAWINGS OR AS DIRECTED BY THE OWNER. AND SHALL SATISFY ALL APPL ORDINANCES. OR REGULATIONS OF THE GOVERNING BODIES WHETHER SO SHOWN OR NOT. ALL MODIFICATIONS REQUIRED BY SUCH AUTHORITIES SHALL BE MADE BY THE CO WITHOUT ANY ADDITIONAL COST TO THE OWNER.

# MATERIALS AND WORKMANSHIP

A. ALL MANUFACTURED ARTICLES, MATERIALS. AND EQUIPMENT SHALL BE APPLIED AS RECOMMENDED BY THE MANUFACTURERS. AND UNLESS OTHERWISE SPECIFIED SHALL FREE FROM ANY DEFECTS. ALL LIKE MATERIALS USED SHALL BE OF THE SAME MANUFACTURE AND QUALITY UNLESS OTHERWISE SPECIFIED.

B. ALL WORK UNDER THIS CONTRACT SHALL BE PERFORMED BY COMPETENT WORKMEN AND EXECUTED IN A NEAT AND WORKMANLIKE MANNER. WORK SHALL BE PROPERLY P DURING CONSTRUCTION. AND ON COMPLETION. THE INSTALLATION SHALL BE THOROUGHLY CLEANED AND ALL DEBRIS PRESENT AS A RESULT OF THIS CONTRACT SHALL BE RE THE PREMISES. DO NOT JUST ABANDON.

#### CODE AND REGULATIONS

EACH SUBCONTRACTOR SHALL COMPLY WITH ALL LAWS. ORDINANCES. RULES AND REGULATIONS BEARING ON THE CONDUCT OF THE WORK AS DRAWN OR SPECIFIED. IF A SU OBSERVES THAT THE DRAWINGS AND SPECIFICATIONS ARE AT A VARIANCE. HE SHALL PROMPTLY NOTIFY THE GENERAL CONTRACTOR AND THE TENANT IN WRITING. IF ANY SU PERFORMS ANY WORK KNOWING IT TO BE CONTRARY TO LAWS, ORDINANCES. RULES AND REGULATIONS AND WITHOUT GIVING SUCH NOTICE. THE SUBCONTRACTOR SHALL BE ARISING THEREFROM.

### PROTECTION OF WORK AND PROPERTY

A) EACH SUBCONTRACTOR SHALL CONTINUOUSLY MAINTAIN ADEQUATE PROTECTION OF ALL HIS WORK FROM DAMAGE AND SHALL PROTECT THE OWNER'S PROPERTY FROM I ARISING FROM HIS WORK. HE SHALL MAKE GOOD ANY SUCH DAMAGE. INJURY. OR LOSS. EXCEPT SUCH AS MAY BE DIRECTLY DUE TO CAUSES BEYOND HIS CONTROL AND NOT NEGLIGENCE. HE SHALL ADEQUATELY PROTECT ADJACENT PROPERTY AS WELL.

B) EACH SUBCONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE SAFETY OF THEIR EMPLOYEES ON THE WORK AND SHALL COMPLY WITH ALL PROVISIONS OF F AND LOCAL BUILDING CODES AND SAFETY LAWS TO PREVENT ACCIDENTS OR INJURY TO PERSONS ON OR ADJACENT TO THE PREMISES WHERE THE WORK IS BEING PERFORM SUBCONTRACTOR SHALL MAINTAIN ALL INSURANCE REQUIRED TO PROTECT HIMSELF. OWNER AND TENANT FOR THE DURATION OF THE WORK AGAINST PROPERTY OAMAGE AI LIABILITY.

# CHANGES IN THE WORK

THE TENANT WITHOUT INVALIDATING THE CONTRACT, MAY ORDER EXTRA WORK OR MAKE CHANGES BY ALTERING. ADDING TO OR DEDUCTING FROM THE WORK. THE CONTRACT ADJUSTED ACCORDINGLY.

### <u>COOPERATION</u>

ALL WORK UNDER THESE SPECIFICATIONS SHALL BE ACCOMPLISHED IN CONJUNCTION WITH OTHER CONTRACTORS AND TRADES OF THIS PROJECT IN A MANNER WHICH WILL A CONTRACTOR AND TRADE ADEQUATE TIME AT THE PROPER STAGE OF CONSTRUCTION TO FULFILL HIS CONTRACTS. REFERENCE SHALL BE MADE TO THE OWNER FOR INSTRUCT ANY QUESTIONS ARISE BETWEEN TRADES AS TO THE PLACING OF LINES. DUCTS, CONDUITS. FIXTURES. OR EQUIPMENT. OR SHOULD IT APPEAR DESIRABLE TO REMOVE ANY GE CONSTRUCTION WHICH WOULD AFFECT THE APPEARANCE OR STRENGTH OF THE STRUCTURE.

MANUFACTURER'S NAMES ARE LISTED HEREIN TO ESTABLISH A STANDARD. THE PRODUCTS OF OTHER MANUFACTURERS WILL BE ACCEPTABLE. IF IN THE OPINION OF THE TEN SUBSTITUTE MATERIAL IS OF A QUALITY AS GOOD OR BETTER THAN THE MATERIAL SPECIFIED. AND WILL SERVE WITH EQUAL EFFICIENCY AND DEPENDABILITY. THE PURPOSE F ITEMS SPECIFIED WERE INTENDED.

### SHOP DRAWINGS

SHOP DRAWINGS AND CATALOG DATA ON ALL MAJOR ITEMS OF EQUIPMENT AND SYSTEMS. AND SUCH OTHER ILLUSTRATIVE MATERIAL AS MAY BE CONSIDERED NECESSARY B' SHALL BE SUBMITTED BY THIS CONTRACTOR IN ADEQUATE TIME TO PREVENT DELAY AND CHANGES DURING CONSTRUCTION.

# DRAWINGS AND SPECIFICATIONS

A) THE DRAWINGS SHOW DIAGRAMMATICALLY THE LOCATIONS OF THE VARIOUS LINES, DUCTS, CONDUITS. FIXTURES. AND EQUIPMENT AND THE METHOD OF CONNECTING AND THEM. IT IS NOT INTENDED TO SHOW EVERY CONNECTION IN DETAIL AND ALL FITTINGS REQUIRED FOR A COMPLETE SYSTEM.
 B) SHOULD ANY CHANGES BE DEEMED NECESSARY BY THE CONTRACTOR IN ITEMS SHOWN ON CONTRACT DRAWINGS. THE SHOP DRAWINGS. DESCRIPTIONS. AND THE REASON PROPOSED CHANGES SHALL BE SUBMITTED TO THE OWNER FOR APPROVAL.

### RESPONSIBILITY

A) THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE SATISFACTORY AND COMPLETE EXECUTION OF ALL WORK INCLUDED IN HIS CONTRACT. HE SHALL PRODUCE COMP OPERATING SYSTEMS AND PROVIDE ALL INCIDENTAL ITEMS REQUIRED AS PART OF HIS WORK, REGARDLESS OF WHETHER SUCH ITEM IS PARTICULARLY SPECIFIED OR INDICAT B) CONTRACTOR SHALL SUPPLY TO LANDLORD AND TENANT A CERTIFIED BALANCE REPORT AT COMPLETION OF PROJECT. THIS IS REQUIRED FOR BOTH REMODELED AND NEW GENERAL PROVISIONS

A) SCOPE: PROVIDE ALL LABOR. MATERIAL. AND EQUIPMENT IN ACCORDANCE WITH THESE SPECIFICATIONS AND THE ACCOMPANYING DRAWINGS TO PROVIDE A COMPLETE AN OPERATING PLUMBING SYSTEM FOR THE BUILDING. OBTAIN WATER, SEWER, GAS TAPS AND ANY OTHER REQUIRED UTILITIES AND EXTEND SERVICE FROM SAME TO BUILDING A DRAWINGS. VISIT THE SITE FOR UNDERSTANDING OF THE WORK TO BE DONE BEFORE SUBMITTING BID. COORDINATE THIS WORK WITH THE WORK OF THE OTHER TRADES ON T ALL PLUMBING IS TO BE ROUGHED IN WHILE THE BUILDING IS BEING CONSTRUCTED AT SUCH TIMES AS NOT TO DELAY THE GENERAL CONTRACTOR ON THE BUILDING.
 B. GENERAL REQUIREMENTS: COMPLY WITH ALL FEDERAL. STATE. AND LOCAL REQUIREMENTS. CODES. RULES. AND ORDINANCES GOVERNING WORK OF THIS CHARACTER. PAY OBTAIN NECESSARY CONSTRUCTION PERMITS AND CERTIFICATES OF INSPECTION.

1. DRAWINGS: THE LOCATION OF THE PIPING RUNS ARE APPROXIMATE AND THE CONTRACTOR MUST MAKE ANY NECESSARY CHANGES IN THE PIPING RUNS ETC. AT NO ADDITION THE OWNER. OUTLET LOCATIONS ARE CRITICAL AND MUST BE LOCATED EXACTLY ACCORDING TO THE PLUMBING PLAN. COORDINATE THIS WORK WITH THE INSTALLERS OF EQ FURNISHED AND INSTALLED BY OTHERS. REFER TO THE OTHER DRAWINGS FOR DETAILS OF THE BUILDING CONSTRUCTION AND THE OTHER MECHANICAL. ELECTRICAL, AND EC FEATURES.

2. COORDINATION AND WORKMANSHIP: SCHEDULE THIS WORK SO THAT IT WILL BE PROPERLY COORDINATED WITH ALL OTHER TRADES. WORKMANSHIP SHALL BE IN ACCORDAN BEST PRACTICE FOR THE CLASS OF WORK INVOLVED. WORKMANSHIP SHALL ALLOW THE APPLIANCE TO OPERATE AS INTENDED AND BE INSTALLED TO BEST PROTECT THE PUE OPERATORS FROM INJURY OR DAMAGE. AND TO PRESENT A NEAT. PLEASING. AND ORDERLY APPEARANCE.

		PLUMBIN	G EQUIPMENT S	CHEDULE	WA	TER	WA	STE
Item No.	Qty.	Description	MANUFACTURER	MODEL	Hot	Cold	Direct	Indirect
1	4	WATER CLOSET	AMERICAN STANDARD	MADERA 2857.016			E	
	4	ELONGATED SEAT	AMERICAN STANDARD	EXTRA HD COMMERCIAL TOILET SEAT 5905.100				
	4	FLUSH VALVE	SLOAN	REGAL 111XL		1"		
2	2	URINAL	AMERICAN STANDARD	WASHBROOK 6590001.020			2"	
3	4	VANITY SINK	AMERICAN STANDARD	AQUALYN DROP IN SINK 0476.028			2"	
3A	1	LAVATORY	AMERICAN STANDARD	LUCERNE 0356.041			2"	
	5	LAVATORY FAUCET***	DELTA	2529LF-HDF	1/2"	1/2"		
	3	THERMAL MIXING VALVES	WATTS	LFMMV	1/2"	1/2"	2"	
17	1	DRINKING FOUNTAIN	ELKAY	EZSTL8WSLK		1/2"	2"	
18	2	SWIM SUIT DRYER	SUITMATE	115V/60HZ UNIT				HD
20	6	SHOWER***	MOEN	L2352	1/2"	1/2"		TD
	6	MIXING VALVE	MOEN	8370HD	1/2"	1/2"		
23	1	COFFEE MACHINE	KEURIG	K150P		1/2" ┥		
25	1	DROP-IN SINK	AMERICAN STANDARD	15SB.252211.073			2"	
26	1	SINK FAUCET***	AMERICAN STANDARD	4005F.002	1/2"	1/2"		
MS	1	MOP SINK	MUSTEE	63M			3"**	
	1	MOP SINK FAUCET***	FIAT	830AA000	1/2"	1/2"		
FD	4	FLOOR DRAINS*	EXISTING	EXISTING			E	
TD		TRENCH DRAIN	EXISTING	EXISTING				

ECIFICATIONS. ES OTHERWISE	<u>GUARANT</u> EE MATERIALS GUARANTEE AND WORKMANSHIP SHALL BE GUARANTEED FO MAY OCCUR DURING THE TERM OF THE AFOREMENTIONED GUARANTEE V MATERIAL AND PERFORMANCE	R ONE (1) YEAR FROM DATE VILL BE REPAIRED AND/OR F	OF FINAL ACCEP REPLACED AT NO	TANCE. DEFEC EXPENSE TO 1	TIVE WORK AN HE OWNER.	ND ALL DAMAGES C/
ERRED TO. ON SHALL BE AS	A) <u>MATERIALS:</u> ALL MATERIALS SHALL BE NEW AND OF THE QUALITY INDIC MANUFACTURES MAY BE ACCEPTABLE PROVIDED A LIST OF SUCH SUBST AFTER CONTRACT IS LET. B) BACKELLING: PERFORMALL NECESSARY EXCAVATING AND BACKELLING	ATED BY THE BRAND NAMES	S. SUBSTITUTION VRITING. A SUBST	S OF MATERIA ITUTIONS LIST	LS OF EQUAL ( SHALL BE SUE	QUALITY BY OTHER BMITTED IN TRIPLIC
NS AND UTILITY	SCREENINGS SO AS TO ELIMINATE SHIMING AND VOID SPACES UNDER A DIRECTION IS NECESSARY ON PRESSURE PIPES, "COMPATIBLE" COUPLING FOOTINGS SHALL BE BACKFILLED WITH 2000 PSI CONCRETE. OTHER BACK CONDITION. IN THE EVENT THE BACKFILL SHOULD SETTLE BEFORE THE FI TAKEN TO MINIMIZE THE DUST LEVEL WHEN EXCAVATING AND BACKFILLIN DUST).	NY OF THE UTILITY SERVICE GS OR EQUAL SHALL BE USE (FILL SHALL CONSIST OF 2-3 NAL TOP SURFACE IS APPLI IG SO AS TO COMPLY WITH I	E PIPES. BENDING ED AND BENDS MA " OF SAND OR RC ED, APPLY ADDIT FEDERAL AND ST	OF ANY HARE NY NOT EXCEE CK SCREENIN ONAL BACKFIL ATE E.P.A REG	D PIPE WILL NO D 90 DEGREES GS AND EARTH L TO SUSTAIN ULATIONS REL	T BE PERMITTED. W ALL EXCAVATION TO A FINAL LEVEL THE ORIGINAL LEV ATING TO THIS TYP
LICABLE CODES. ONTRACTOR	C) <u>PIPING INSTALLATION:</u> CLEAN-OUTS MUST BE INSTALLED ON MINIMUM I SIZE OF PIPE. REAM ALL PIPE AFTER CUTTING. THEN TURN PIPES ON END SOIL AND WASTE PIPES WITH LONG RADIUS FITTINGS OR WITH V BRANCH SUPPLY PIPES TO FIXTURES AND WASTE PIPES FROM FIXTURES SHALL BE	DROP LINES EVEN THOUGH AND KNOCK OUT ALL LOOSI ES AND 1/8 OR 1/16 BENDS. E CENTERED IN THE PROPER	NOT SHOWN ON T E DIRT AND SCALI CONNECT SOIL S R PLACE RELATIV	THE BLUEPRIN E BEFORE INS FACKS AT BAS E TO THE CEN	ts. Use redu( Falling. Make E to horizon Ter line of ti	CING FITTINGS IN M. E CHANGES IN HORI. TAL RUNS WITH "Y" HE FIXTURE. NO OF
BE NEW, AND	ALL PIPES SHALL BE RUN MECHANICALLY STRAIGHT AND SQUARE WITH B MADE WITH FITTINGS. WATER PIPING TO BE ROUTED IN WALLS. UNDER TH SLAB NO MECHANICAL JOINTS SHALL BE MADE LINDER THE SLAB EXCEPT	UILDING LINES. EXCEPT FOF IE FLOOR SLAB. AND ABOVE AS LISTED BELOW, WATER	R REQUIRED PITC SUSPENDED CEI	H ON HORIZON LINGS AS NOT	ITAL LINES. AN ED. WHERE WA	D ALL CHANGE <mark>S IN</mark> ATER LINES ARE RO VERTICAL NOR HORI
PROTECTED EMOVED FROM	THE SEATING OF UNIONS. UNIONS SHALL BE COPPER TYPE NIBCO #733 OF NO WAX. PUTTY. OR VARNISH WILL BE PERMITTED. CRACKED FITTINGS SHOP THREADING TO THE SHOULDER OF THE FITTINGS. NO SUP JOINTS OF	R EQUAL. ALL BE REMOVED AND REP R COUPLING JOINTS IN BRAS	LACED WITH NEW	FITTINGS. MA	KE THREADED	JOINTS IN BRASS F
JBCONTRACTOR UBCONTRACTOR EAR ALL COSTS	D) <u>NATURAL GAS PIPING</u> : FOR ABOVE GROUND INSTALLATIONS, ALL FITTIN PRACTICES OF AGA AND NFPA 54. UNIONS SHALL BE CAST BLACK IRON AN PROPER ALIGNMENT WILL BE MADE AT TIME OF INSTALLATION. ALL JOINT ENAMEL PAINT. ROUGH OR SHARP EXPOSED THREAD SURFACES SHALL B WATER PIPES	NGS TO BE JOINED WITH TEP ND INSTALLED IN A MANNER S AND CONNECTIONS SHALL SE FILED SMOOTH. TESTING S	SUCH THAT NO S BE THOROUGHL SHALL BE AS OUT	TRESS WILL BI Y CLEANED OF LINED UNDER	FABLE SEAL AN E PLACED ON T OIL. THREAD SECTION 15A.	ND MADE IN CONFO THE MALE-FEMALE S CUTTINGS AND RES PARAGRAPH 11. TE
	JOINTS SHALL BE CLEANED AND DEBURRED AS RECOMMENDED BY THE M	IANUFACTURER AND FEDER	AL, STATE AND LO	OCAL CODES A	ND SOLDERED	AS LISTED BELOW
ALL HIS FAULT OR	A. <u>ABOVE GRADE:</u> WHERE FITTINGS ARE SOLDERED BOTH FITTINGS AND T DIRECT CONTACT WITH COOPER TUBING; E.G., GALVANIZED STRAPPING, I	TUBING SHALL BE CLEANED , HANGERS, OR CLAMPS TO S	AS DESCRIBED A ECURE THE TUBI	BOVE. UNDER NG.	NO CIRCUMST	ANCES SHALL DISS
FEDERAL, STATE IED. EACH ND PUBLIC	B. <u>BELOW GRADE:/ FLOOR SLAB ON EARTH OR STONE FILL:</u> HIGH TEMPER. NOTE: WATER PIPE TO BE PROPERLY SECURED AND ALIGNED SO AS NOT THE UNIONS.	ATURE, SOLDER, 1200°F OR TO EXERT VERTICAL OR HO	GREATER MELTIN	IG POINT. SES ON THE S	EATING OF TH	E MATING (MALE AN
CT SUM BEING	<ul> <li>A. MATERIALS - UNDERGROUND: TYPE "L" COPPER TUBE, SOFT TEMPER</li> <li>B. MATERIALS - ABOVEGROUND: TYPE "L" COPPER TUBE, HARD DRAWN</li> <li>C. INSULATION: INSULATION FOR HOT AND COLD WATER &amp; HOT WATER RE</li> <li>25 WITH ASJ/SSL FOIL/VINYL JACKET OR EQUAL, INSULATE ALL PIPING A</li> </ul>	TURN PIPING SHALL BE 1/2"	( 1" ON 1ST 8FT. F	ROM TANK) TI	HICK ARMAFLE	X UL LABELED OR F
	GAS PIPING					
ENERAL	A. UNDERGROUND GAS PIPING: ASTM A53. SCHEDULE 40 BLACK STEEL PIP APPROVED BY LOCAL GAS COMPANY AND AUTHORITY HAVING JURISDICT B. GAS PIPING ABOVE GROUND: ASTM A53. SCHEDULE 40 BLACK STEEL W	PE WITH LONG RADIUS STEE ION. ITH 125 POUND BLACK MALL	EL WELDING FITTI		G CATHODIC P	ROTECTION OR POI
IANT. THE FOR WHICH THE	HEATER. AND KITCHEN EQUIPMENT. C. GAS PIPING COMPOUND AT JOINTS: IN COMPLIANCE WITH NFPA BULLET WASTE PIPING	FIN #54 AND LOCAL APPLICA	BLE CODES AND	SUITABLE FOR	NATURAL GAS	SERVICE.
3Y THE TENANT.	PVC SCH. 40. CAST IRON - HUB TYPE WITH NEOPRENE JOINTS - WITH STAI AND SLOPE OF DRAINAGE PIPING SHALL BE 1/4" PER FOOT OF RUN FOR P PIPE SLEEVES/ESCUTCHEONS	NLESS STEEL CONNECTORS IPE 2-1/2" & SMALLER, 1/8" PE	S ON ALL PIPES W ER FOOT OF RUN	HEN PVC IS NO FOR PIPE 3" TO	DT ALLOWED P D 6".	ER LOCAL CODE. IN
D CONTROLLING	PROVIDE CHROME-PLATED ESCUTCHEONS ON ALL PIPES PASSING THROU EQUIVALENT WITH SET-SCREWS. PROVIDE ESCUTCHEONS ON ALL WASTE COUNTERS OR EXPOSED. PIPE SLEEVES SHALL BE PROVIDED WHEN PIPE PLUMBING FIXTURES	JGH WALLS. FLOORS, OR CE LINES FROM PLUMBING FIX S PENETRATE FOUNDATION	EILINGS OF FINISH (TURES, WHETHE   AND SHALL BE 1'	ed Rooms. Es R Through W Larger Than	SCUTCHEONS <sup>-</sup> ALLS. FLOORS I PIPE, SEAL SI	TO BE BEATON & CA AND WHETHER CC LEEVE W/CAULKING
PLETE FINISHED TED. V STORES.	FURNISH AND INSTALL PLUMBING FIXTURES AS SHOWN ON DRAWINGS WI CONSTRUCTION. ANY FIXTURE DAMAGED SHALL BE REPLACED WITHOUT INCLUDING BUT NOT LIMITED TO WATER. DRAIN, AND GAS PIPES TO EQUIF MACHINES AND BEVERAGE EQUIPMENT SUPPLY CONNECTIONS.	TH ALL ACCESSORIES AND <sup>-</sup> ADDITIONAL EXPENSE TO TH PMENT AS INDICATED IN EQU	TRIM AS LISTED. A HE OWNER. CONN JIPMENT SPECIFI	LL FIXTURES ECTION TO OT CATIONS. PRO	SHALL BE PRO HER FIXTURES VIDE BACKFLO	TECTED THROUGH S CONNECT BUILDIN W PROTECTION ON
	<u>TEST</u> S A. DRAINAGE AND VENT PIPING- DRAINAGE AND VENT PIPING SHALL BE TE	ESTED BEFORE THE PLUMBI	NG FIXTURES ARE	E INSTALLED B	Y CAPPING TH	E OPENINGS AND F
AS SHOWN ON THE PROJECT.	WITH WATER AND ALLOWING IT TO STAND THUS FILLED NOT LESS THAN C B. WATER PIPING - THE WATER SUPPLY PIPING LINES SHALL BE TESTED B APPLYING HYDROSTATIC PRESSURE OF 100 PSI AND ALLOWING TO STAND	DNE (1) HOUR. INSPECT WAT EFORE THE PLUMBING FIXTU D FOR NOT LESS THAN FOUR	ER LEVEL TO DET URES ARE CONNE R (4) HOURS AT TH	ERMINE IF PIP CTED BY FILL IIS PRESSURE	ING IS TIGHT. NG THE ENTIR TO PROVE PLI	E SYSTEM WITH PC
ONAL COST TO	C. GAS PIPING - IN LIEU OF LOCAL REQUIREMENTS. GAS PIPING SHALL BE CHECKED BY LIQUID SOAP OR SPECIAL LIQUID CHEMICAL FOR LEAKS. NO	FILLED WITH COMPRESSED TE: REMOVE ALL GAS VALVE	AIR TO 150 PSI AI S AND PROTECT	ND HELD FOR A	E BEFORE TES	OUR (4) HOURS. EA TING SYSTEM.
QUIPMENT QUIPMENT	UPON COMPLETION OF INSTALLATION DISINFECT THE WATER SYSTEM BY 24 HOURS OR THE WATER SYSTEM BY FLUSHING IT WITH SOLUTION CONT	FLUSHING IT WITH SOLUTIO	ON CONTAINING 5 LION OF CHLORIN	) PARTS PER N E AND ALLOW	/ILLION OF CHI IT TO STAND F	LORINE AND ALLOW
NCE WITH THE BLIC AND	3 HOURS OR BEFORE FLUSHING THOROUGHLY AND RETURNING TO SERV BEEN DISINFECTED. THIS PROCEDURE TO BE IN ACCORDANCE WITH STAT <u>CLEAN-UP</u> CLEAN ALL PLUMBING FIXTURES AND EQUIPMENT THOROUGHLY BEFORE	ICE. FURNISH CLEAN WATEF IE PLUMBING CODE. FINAL INSPECTION LEAVING	R SAMPLES TO TH	E LOCAL AUTH	IORITY FOR TE	ESTING AFTER THE
	OWNER'S MANUAL PROVIDE THE OWNER AT THE COMPLETION OF THIS CONTRACT WITH AN ' ALL PRINTED MATTER SUCH AS: GUARANTEE CARDS. CLEANING INSTRUC' THE SHIPPING CARTONS OR FOUIPMENT HOUSINGS	'OWNER'S MANUAL" SO LABB TIONS. NOTICES TO OWNER	ELED. THE MANUA . OPERATING MAN	L SHALL CON IUALS, AND MA	SIST OF A THRI AINTENANCE IN	EE-RING LOOSE-LEA
ERAL NOTES		SCOPE OF	WORK			
TURES MUST BE PROVIDED WITH READILY ACCESSIBLE STOPS AND APPROPRIATELY MARKED PANELS, COORDINATE LOCATIONS WITH GENERAL CONTRACTOR PRIOR TO INSTALLATION.		PROVIDE ALL PLUMBING FOR MODIFICATIONS TO INDOOR SWIMMING FACILITY INCLUDING ALL DOMESTIC WATER, SANITARY & GAS LINES AND CONNECT TO EXISTING UTILITIES. REUSE EXISTING GAS FIRED TANK TYPE WATER HEATER.				
H GOOD ENGINEERING PRACTICE. RIC COUPLINGS ARE REQUIRED BETWEEN ALL DISSIMILAR METAL IN PIPING AND EQUIPMENT TIONS; EXCEPT AT WATER HEATER AS PER CODE.		COORDINATE WITH GC AND MECHANICAL CONTRACTOR TO PROVIDE CONDENSATE LINES FOR PADDOCK SYSTEM AND GAS FLUE FOR NEW WATER HEATER.				
COPPER PIPE FROM I CHROME PLATED CO ANOUTS.	HANGER OR SUPPORTS WITH ISOLATOR PAD. OMBINATION COVER PLATE AND CLEAN OUT PLUG OR ACCESS PANEL FOR	FIXTURE BI	RANCH S	CHEDUL	ES	
BUSTIBLE MATERIAL T IRN AIR PLENUMS.		FIXTURE	COLD HOT WATER WATE	R WASTE	VENT	
SATE DRAIN LINES TO	D BE RUN UNDER SLAB IN PVC SCH40 PIPE AND STUBBED OUT OF WALL OTHERS. PVC PIPING WITH 1/2" THICK ARMAFLEX INSULATION MAY	WATER CLOSET(VALVE) LAVATORY MOP SINK	1"            1/2"         1/2"           1/2"         1/2"	E 2" 3"	E 1-1/2" 2"	
LUCATIONS WHEF CATION OF PIPING. PV L BE MIN. SCHEDULE	CE ALLOWED BY LOCAL CODES. SEE PLUMBING DRAWINGS FOR SIZE C WILL BE MIN. SCHEDULE 40 FOR SIZE AND LOCATION OF PIPING. 40.		 1/2" 1/2" 1/2"	E 2" 2"	E 1-1/2" 1-1/2"	
E ANGLE STOPS ON AL	L WATER SERVICE LINES TO FIXTURES FOR INDIVIDUAL SHUT-OFF.		E 1/2	2"	1-1/2"	
HAMMER ARRESTORS	AS PER INTERNATIONAL 2020 NEW YORK STATE PLUMBING CODE PROVIDE ANTI-SCALDING VALVE FOR SHOWERS.					
IG CONTRACTOR SHA NCE (EXAMPLE: CENT	LL REVIEW WALL FINISHES @ LOCATION REQUIRING BARRIER-FREE FER LINE TO TOILET).					

![](_page_14_Figure_33.jpeg)

NSTALL HORIZONTAL DRAIN

ADWELL. #10. 40. 6A OR ONCEALED BEHIND G.

- H THE COURSE OF THE ING SERVICE PIPING. IN COFFEE
- FILLING THE ENTIRE SYSTEM
- OTABLE WATER AND Y. ACH JOINT SHALL BE
- W IT TO STAND FOR

EAF BINDER CONTAINING

L	.EGEND
	SANITARY SEWER PIPING
	VENT PIPING
	DOMESTIC COLD WATER PIPING
	HOT WATER PIPING
	HOT WATER RETURN PIPING
	PIPE UP
	PIPE DROP
	GAS PIPING
	CAPPED END OF PIPE
	FLOOR CLEAN OUT
	P-TRAP
	SHUT-OFF VALVE
	DOMESTIC COLD WATER
	HUB DRAIN
	URINAL
	DOMESTIC HOT WATER
	DOMESTIC HOT WATER RETURN
	GATE VALVE
	CHECK VALVE
	GAS SHUT-OFF VALVE
	BALANCING VALVE
	WATER HAMMER ARRESTER
	FLOOR DRAIN
	POINT OF CONNECTION
	THERMOSTATIC MIXING VALVE

SNBBRS SINGINE SSING
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PROJECT
NINS-L-YVS REVISIONS DATES:
PROFESSIONAL SEAL
ISSUE DATE: PROJECT #: DRAWN BY: <u>NYE</u> CHECKED BY: <u>NYE</u> PLUMBING NOTES & SCHEDULES
P-1

![](_page_15_Figure_0.jpeg)

- EXISTING LAVATORY TO REPLACE WITH NEW AND CONNECT WITH EXISTING PLUMBING CONNECTION. CONTRACTOR TO FIELD VERIFY CONDITION OF EXISTING PIPING AND REPLACE IF REQUIRED.
- 2 EXISTING WATER CLOSET TO REPLACE WITH NEW AND CONNECT WITH EXISTING PLUMBING CONNECTION. CONTRACTOR TO FIELD VERIFY CONDITION OF EXISTING PIPING AND REPLACE IF REQUIRED.
- 3 EXISTING URINAL TO REPLACE WITH NEW AND CONNECT WITH EXISTING PLUMBING CONNECTION. CONTRACTOR TO FIELD VERIFY CONDITION OF EXISTING PIPING AND REPLACE IF REQUIRED.
- EXISTING FLOOR DRAIN TO REMAIN WITH SANITARY AND VENT CONNECTION, ASSOCIATED ACCESSORIES AND FITTINGS. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING PIPING AND REPLACE IF REQUIRED.
- CONNECT NEW 3" SANITARY LINE TO EXISTING SANITARY LINE OF ADEQUATE SIZE. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION, SIZE, INVERT AND FLOW DIRECTION OF EXISTING SANITARY LINE AND UPGRADE IF REQUIRED.
- FLOW DIRECTION OF EXISTING SANITARY LINE AND UPGRADE IF REQUIRED.
   CONNECT NEW 2" SANITARY LINE TO EXISTING SANITARY LINE OF ADEQUATE SIZE. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION, SIZE, INVERT AND FLOW DIRECTION OF EXISTING SANITARY LINE AND UPGRADE IF REQUIRED.
- EXISTING BACKWASH SUMP PIT TO REMAIN WITH SANITARY AND VENT CONNECTION, ASSOCIATED ACCESSORIES AND FITTINGS. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING PIPING AND REPLACE IF REQUIRED.
- EXISTING TRENCH DRAIN TO REMAIN WITH SANITARY AND VENT CONNECTION, ASSOCIATED ACCESSORIES AND FITTINGS. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING PIPING AND REPLACE IF REQUIRED.

# **GENERAL NOTES**

- . SLOPE OF DRAINAGE PIPING SHALL BE 1/8" PER FOOT OF RUN FOR PIPE 3" TO 6" AND 1/4" PER FOOT OF RUN FOR PIPE 2-1/2" AND SMALLER. VENT PIPING SHALL BE PITCHED TO DRAIN.
- 2. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
- 3. ALL MATERIAL INDICATED AND IMPLIED ON THESE DRAWINGS SHALL BE NEW UNLESS OTHERWISE NOTED.
- 4. PROVIDE ACCESS PANELS FOR CLEANOUTS AS REQUIRED.
- 5. REFER SANITARY RISER DIAGRAM FOR ALL PIPE SIZES.
- CONTRACTOR TO VERIFY THE EXISTING SANITARY AND VENT LOCATION AND ROUTING. MAKE NECESSARY CHANGES TO NEW PIPING AS PER THE EXISTING SITE CONDITION.

![](_page_15_Figure_16.jpeg)

![](_page_16_Figure_0.jpeg)

![](_page_16_Figure_1.jpeg)

![](_page_16_Figure_2.jpeg)

![](_page_16_Picture_3.jpeg)

# SANITARY KEYED NOTES

- CONNECT NEW 3" SANITARY LINE TO EXISTING SANITARY LINE OF ADEQUATE SIZE. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION, SIZE, INVERT AND FLOW DIRECTION OF EXISTING SANITARY LINE AND UPGRADE IF REQUIRED.
- CONNECT NEW 2" SANITARY LINE TO EXISTING SANITARY LINE OF ADEQUATE SIZE. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION, SIZE, INVERT AND FLOW DIRECTION OF EXISTING SANITARY LINE AND UPGRADE IF REQUIRED.
- CONNECT NEW 2" VENT LINE TO EXISTING VENT LINE OF ADEQUATE SIZE. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION AND SIZE OF EXISTING VENT LINE AND UPGRADE IF REQUIRED.
- CONNECT NEW 1<sup>1</sup>/<sub>2</sub>" VENT LINE TO EXISTING VENT LINE OF ADEQUATE SIZE. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION AND SIZE OF EXISTING VENT LINE AND UPGRADE IF REQUIRED.

![](_page_16_Figure_9.jpeg)

![](_page_16_Figure_10.jpeg)

# **GENERAL NOTES**

- 1. CW/HW/HWR PIPING TO BE APPROVED WITH INSULATION AS PER 2020 NEW YORK STATE ENERGY CONSERVATION CODE.
- 2. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI.
- 3. PROVIDE ACCESS PANELS FOR SHUT-OFF VALVES AS REQUIRED.
- 4. REFER WATER RISER DIAGRAM FOR ALL PIPE SIZES.
- CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
- 6. EXISTING WATER HEATER DRAIN REMAIN AS IT IS.
- 7. ALL EXISTING CW, HW & HWR PIPING IN CEILING TO BE REUSED. PROVIDE NEW PIPING ONLY WHERE REQUIRED AS SHOWN.
- 8. EXISTING MAIN SERVICE LINE WITH BFP AND WATER METER TO REMAIN AS IT
- 9. CONTRACTOR TO FIELD VERYFY THE SIZE AND LOCATION OF THE EXISTING WATER METER AND BFP, AND UPGRADE IF REQUIRED.
- 10. CONTRACTOR TO FIELD VERIFY THE EXISTING GAS PIPE SIZE, LOCATION & PRESSURE ON SITE, AND UPGRADE IF REQUIRED.

# **PLUMBING WATER & GAS KEYED NOTES**

- EXISTING WATER HEATER TO REMAIN WITH EXISTING RECIRCULATION PUMP, EXPANSION TANK, WATER PIPING, GAS PIPING AND ASSOCIATED ACCESSORIES AND FITTINGS. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING WATER HEATER AND PROVIDE NECESSARY ACCESSORIES IF REQUIRED.
- EXISTING WATER CLOSET TO REPLACE WITH NEW AND CONNECT WITH EXISTING CW CONNECTION. CONTRACTOR TO FIELD VERIFY CONDITION OF EXISTING PIPING AND REPLACE IF REQUIRED.
- EXISTING LAVATORY TO REPLACE WITH NEW AND CONNECT WITH EXISTING CW/HW/HWR CONNECTION. CONTRACTOR TO FIELD VERIFY CONDITION OF EXISTING PIPING AND REPLACE IF REQUIRED.
- EXISTING URINAL TO REPLACE WITH NEW AND CONNECT WITH EXISTING CW CONNECTION. CONTRACTOR TO FIELD VERIFY CONDITION OF EXISTING PIPING AND REPLACE IF REQUIRED.
- 5 CONNECT NEW 1/2" CW LINE TO EXISTING CW WATER LINE OF ADEQUATE SIZE IN SPACE. CONTRACTOR TO FIELD VERIFY THE EXACT SIZE AND LOCATION OF EXISTING CW LINE IN FIELD.
- 6 CONNECT NEW 1/2" CW/HW/HWR LINE TO EXISTING CW/HW/HWR WATER LINE OF ADEQUATE SIZE IN SPACE. CONTRACTOR TO FIELD VERIFY THE EXACT SIZE AND LOCATION OF EXISTING CW/HW/HWR LINE IN FIELD.
- CONNECT NEW 1/2" CW/HW LINE TO EXISTING CW/HW WATER LINE OF ADEQUATE SIZE IN SPACE. CONTRACTOR TO FIELD VERIFY THE EXACT SIZE AND LOCATION OF EXISTING CW/HW LINE IN FIELD.
- CONNECT NEW 1" CW/HW & ½" HWR LINE TO EXISTING CW/HW/HWR WATER LINE OF ADEQUATE SIZE IN SPACE. CONTRACTOR TO FIELD VERIFY THE EXACT SIZE AND LOCATION OF EXISTING CW/HW/HWR LINE IN FIELD AND UPGRADE IF REQUIRED.
- ② CONNECT NEW 1½" GAS LINE TO EXISTING GAS LINE WITH EXISTING GAS METER. CONTRACTOR TO FIELD VERIFY SIZE, PRESSURE AND LOCATION OF EXISTING GAS METER AND LINE AND UPGRADE IF REQUIRED.
- CONNECT NEW ¾" GAS LINE TO EXISTING GAS LINE WITH EXISTING GAS METER. CONTRACTOR TO FIELD VERIFY SIZE, PRESSURE AND LOCATION OF EXISTING GAS METER AND LINE AND UPGRADE IF REQUIRED.
- EXISTING RTU TO REMAIN WITH EXISTING GAS SUPPLY LINE, ASSOCIATED ACCESSORIES AND FITTING. CONTRACTOR TO FIELD VERIFY THE CONDITION AND LOCATION OF THE EXISTING GAS PIPING AND REPLACE IT IF REQUIRED.

EXISTING STORAGE WATER HEATER SCHEDULE					
MANUFACTURER	AO SMITH				
MODEL	BTR-199				
EQUIPMENT TAG	WH-E				
STATUS	EXISTING				
CAPACITY	81 GALLONS				
QUANTITY	1				
MBTU	199				
RECOVERY	242 GPH@90°F				
THERMAL EFFICIENCY	0.8				
VENT/ INTAKE	-				
VOLTAGE	120/1/60				
AMPERAGE	7				
WEIGHT	470 LBS				
CONTRACTOR TO FIELD VERIFY OPERATING CONDITION OF THE EXISTING WATER HEATER AND NOTIFY ENGINEER IF NOT IN OPERATION CONDITION. ALSO FIELD VERIFY GAS REQUIREMENTS AND COORDINATE WITH CONTRACTOR BEFORE COMMENCING THE BID.					

![](_page_17_Figure_25.jpeg)

![](_page_18_Picture_0.jpeg)