# RUTH HOLLEY LIBRARY- LEARNING LAB PIKES PEAK LIBRARY DISTRICT 685 N. MURRAY BLVD. COLORADO SPRINGS, COLORADO 80915

# DESIGN EDGE 711 N. CASCADE AVE. SUITE 10

COLORADO SPRINGS, CO 80903 TELEPHONE: (719) 667-1972

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# DRAWING SYMBOLS ROOM NAME AND NUMBER PLAN NOTE DETAIL REFERENCE NUMBER — — — — — — — — SECTION / ELEVATION NUMBER -----SHEET NUMBER \_\_\_\_\_\_ **REVISION NOTE** FIRE EXTINGUISHER CABINET WALL TYPE

# **GENERAL NOTES**

- ALL WORK WILL BE PERFORMED IN STRICT ACCORDANCE WITH ALL LOCAL LAWS., ORDINANCES, RULES AND REGULATIONS OF GOVERNMENT AUTHORITIES HAVING JURISDICTION. CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING ALL BUILDING PERMITS
- FIRE ALARM AND FIRE SPRINKLER SYSTEM SHALL BE MODIFIED ACCORDING TO ALL LOCAL CODES AND THE NFPA. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO, AND OBTAIN NECESSARY PERMITS FROM THE LOCAL FIRE AND BUILDING DEPARTMENT. FIRE ALARM MODIFICATIONS REQUIRED ARE SHOWN ON THE PLANS. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE FIRE SPRINKLER DESIGN AND PERMITS FOR THIS PROJECT
- PRIOR TO BIDDING CONTRACTOR SHALL VISIT JOB SITE TO REVIEW SCOPE OF WORK AND EXISTING JOB CONDITIONS, THIS INCLUDES ALL DEMOLITION WORK, DIMENSIONS, HVAC, PLUMBING AND ELECTRICAL WORK THAT ARE PART OF THIS CONTRACT.
- CONTRACTOR SHALL IMMEDIATELY NOTIFY ARCHITECT OF ANY CONFLICTS OR OMISSIONS, PRIOR TO THE PERFORMANCE OF THE WORK IN QUESTION.
- CONTRACTOR SHALL NOTIFY ARCHITECT AND OWNER FOR A PRELIMINARY WALK-THROUGH AFTER ELECTRICAL AND DATA BOXES HAVE BEEN SET BUT NOT PIPED. OWNER SHALL HAVE THE OPPORTUNITY TO MAKE MINOR REVISIONS TO OUTLET LOCATIONS BEFORE FINISHING OF ROUGH IN WORK.
- WHERE ELECTRICAL WORK IS SPECIFIED IN CONJUNCTION WITH CABINET WORK, LAMPS AND FIXTURES ARE TO BE PROVIDED BY ELECTRICAL CONTRACTOR. CUTOUTS ONLY FOR SWITCHES, OUTLETS ETC. ARE THE RESPONSIBILITY OF THE CABINET CONTRACTOR AND SHOULD BE COORDINATED WITH THE ELECTRICAL

#### CONTRACTOR.

- 7. ALL DIMENSIONS ARE FROM ONE SIDE OF FINISHED WALL UNLESS OTHERWISE NOTED.
- 8. CONTRACTOR SHALL PROVIDE ADEQUATE BLOCKING IN WALLS TO RECEIVE ALL ATTACHED EQUIPMENT, PLUMBING FIXTURES, MILLWORK, CASEWORK, ETC. NOTE: ALL FRAMING OR CONCEALED BLOCKING SHALL BE METAL OR FIRE RETARDANT
- . DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS GOVERN ALL PARTITION LOCATIONS. ALL DOOR AND OPENING LOCATIONS SHALL BE INDICATED ON PLAN. IN CASE OF CONFLICT, NOTIFY THE ARCHITECT. ALL DIMENSIONS MARKED "CLEAR" SHAL BE MAINTAINED AND SHALL ALLOW FOR THICKNESS OF ALL FINISHES INCLUDING CARPET, PAD, TILE, SHEET VINYL, WAINSCOT, ETC.
- 10. ITEMS INDICATED IN THIS SET OF DOCUMENTS BY OWNER ARE NOT A PART OF THIS CONTRACT, AND ARE TO BE FURNISHED AND INSTALLED BY OWNER UNLESS OTHERWISE NOTED.
- 11. ITEMS INDICATED IN THIS SET OF DOCUMENTS ARE NOT TO BE ALTERED WITHOUT WRITTEN CONSENT FROM THE ARCHITECT OR ENGINEER. IF ALTERATIONS MADE BY THE OWNER OR CONTRACTOR, THE ARCHITECT AND/OR ENGINEER ASSUME NO RESPONSIBILITY FOR SUCH CHANGES.
- 12. ALL WORK SHALL HAVE FINAL INSPECTION BY ARCHITECT AND OWNER. ARCHITECT WILL PREPARE FINAL PUNCH LIST OF DEFICIENT ITEMS THAT MUST BE CORRECTED BEFORE FINAL PAYMENT TO THE CONTRACTOR

# CODE STATEMENT

- **GOVERNING CODES**
- 2017 PIKES PEAK REGIONAL BUILDING CODE (PPRBC)
- 2015 INTERNATIONAL BUILDING CODE (IBC) 2015 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
- 2015 INTERNATIONAL MECHANICAL CODE (IMC) 2015 INTERNATIONAL FUEL GAS CODE (IFGC)
- 2015 INTERNATIONAL PLUMBING CODE (IPC) 2017 NATIONAL ELECTRICAL CODE (NEC)
- 2009 ICC/ANSI A117.1 ACCESSIBILITY STANDARD
- ASME A17.1, 2013 EDITION, SAFETY CODE FOR ELEVATORS & ESCALATORS ASME A17.3, 2011 EDITION, SAFETY CODE FOR EXISTING ELEVATORS & ESCALATORS THE 2009 INTERNATIONAL FIRE CODE AND AMENDMENTS AS ADOPTED BY THE
- COLORADO SPRINGS FIRE DEPARTMENT.

### PROJECT DESCRIPTION

THIS PROJECT IS THE INTERIOR REMODEL OF AN EXISTING LIBRARY TO ENCLOSE STACK SPACE TO CREATE A LEARNING LAB

### CODE DATA

OCCUPANCY CLASSIFICATION CONSTRUCTION TYPE

INTERIOR NON-BEARING WALL NON-RATED

NON-SPRINKLERED-FIRE SPRINKLERS ADJACENT TENANT AND COMMUNITY ROOM IS SPRINKLERED AND SEPARATED FROM

STACK SPACE WITH A 2-HR AREA SEPARATION WALL

OVERALL BUILDING AREA: 51,912 SF (INCLUDING ADJACENT TENANTS) AREA OF LIBRARY (A-3):

## OCCUPANT LOAD AND EXIT REQUIREMENTS

STACKS: CLASSROOM: OFFICES: LOUNGE: READING:	3,962SF 1,291SF 622 SF 315 SF 1089 SF	1/100 SF 1/20 SF 1/100 SF 1/15 SF 1/50 SF	40 OCC. 65 OCC 7 OCC 21 OCC 22 OCC
CONFERENCE:	1.482 SF	1/50 SF 1/15 SF	99 OCC
STORAGE:	1,158 SF	1/300 SF	4 OCC
TOTAL OCCUPANT	LOAD:		258 OCCUPANTS

NO OF EXITS REQUIRED: 2

NO. OF EXITS PROVIDED: 6

EXITING IS UNAFFECTED BY THE MODIFICATIONS

PLUMBING FIXTURE REQUIREMENTS EXISTING PLUMBING FIXTURE COUNT IS UNAFFECTED BY THE MODIFICATIONS

# **PARTICIPANTS**

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SP1 PROJECT SPECIFICATIONS

M0.1 MECHANICAL LEGEND

M1.1 MECHANICAL PLANS

ELECTRICAL E0.1 ELECTRICAL LEGEND

E1.1 ELECTRICAL PLANS

M0.2 MECHANICAL SPECIFICATIONS

E0.2 ELECTRICAL SPECIFICATIONS

E6.0 ELECTRICAL ONE-LINE DIAGRAM

A2.1 DETAILS

PROJECT INFORMATION SHEET

ARCHITECTURAL
A1.1 NOTES, DEMOLITION PLAN, FLOOR PLAN, CEILING PLAN

#### PIKES PEAK LIBRARY DISTRICT CONTACT: GARY SYLING

TEL: 719.531.6333

#### DESIGN EDGE, P.C. 711 N CASCADE AVE, SUITE 100

CONTACT: SWAGATA GUHA, AIA

# TEL: 719.667.1972 X 114

ME ENGINEERS INC

3425 AUSTIN BLUFFS PARKWAY, SUITE 201 COLORADO SPRINGS, CO 80918

CONTACT: DARRELL LACKEY, P.E. TEL: 719.536.0036

685 N MURRAY BLVD, COLORADO SPRINGS, CO 80915

**RUTH HOLLEY LIBRARY** 

NEW LEARNING LAB

PROJECT MGR: PREPARED BY:

DESCRIPTION:

PROJECT DATA

T-1

**ABBREVIATIONS** ACOUSTICAL CEILING TILE ALUM ALUMINUM ANOD ANODIZED

ANGLE BOTTOM OF CONTROL JOINT

**GRAPHIC PLAN SYMBOLS** 

CONTINUOUS SHADED LINE INDICATES

ONE HOUR RATED WALL CONSTRUCTION

DASHED/BROKEN LINE INDICATES

(E) WALL PARTITION

WALL TO BE DEMOLISHED

NEW METAL STUD PARTITION

CENTER LINE CONCRETE MASONRY UNIT CERAMIC TILE DIAMETER

EXISTING EXTERIOR INSULATION AND FINISH SYSTEM **EXPANSION JOINT** ELEVATION

ELECTRIC WATER COOLER FIRE EXTINGUISHER CABINET FLOOR MATERIAL CHANGE FIRE RETARDANT TREATED

FIELD VERIFY GENERAL CONTRACTOR GLZ'G GLAZING HOLLOW METAL

T.O. TUBE STEEL TYPICAL UNLESS OTHERWISE NOTED LAMINATE VINYL COMPOSITION TILE MAXIMUM WD WOOD MINIMUM MIRR MIRROR

NOT IN CONTRACT

NUMBER

NOT TO SCALE

PLUS OR MINUS PRECAST PANEL JOINT

RADIUS

RATING

RUBBER BASE **ROOF DRAIN** 

SPECIFICATIONS

REFER TO ROUGH OPENING

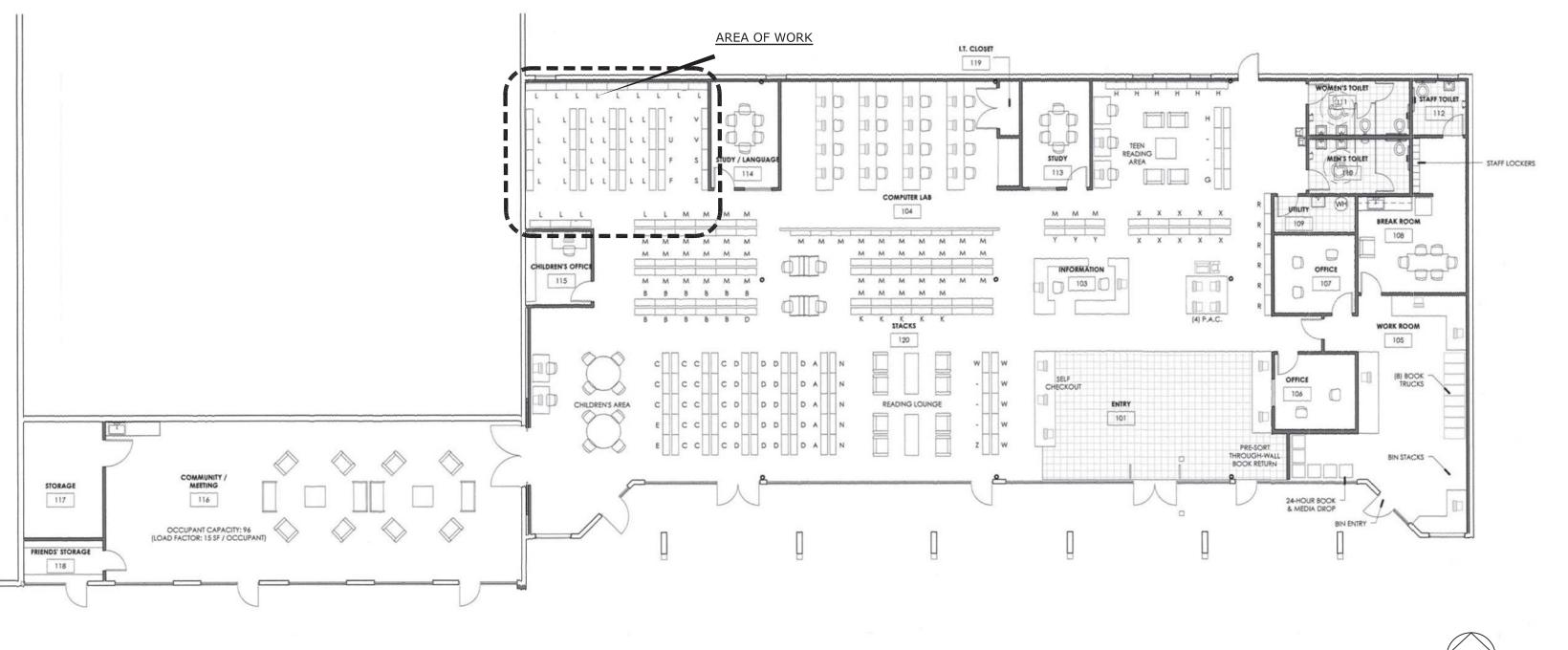
SIMILAR

STEEL

TOP OF

PRESSURE TREATED

ON CENTER OVERFLOW DRAIN KEY PLAN SCALE = NOT TO SCALE





#### Division 1 - General Conditions

- 1.1 All work shall conform to the referenced International Building Code and companion codes
- 1.2 Specific notes and details take precedence over general notes and details.
- 1.3 Contractor shall visit the site and study all contract documents prior to commencing the work and shall notify the Architect of
- any discrepancies or inconsistencies found.
- 1.4 Permits and Fees: Contractor shall obtain and pay for required permits and fees 1.5 Submittals, when required by the drawings or specifications, shall be submitted to the Architect for review and approval.
- Electronic submittals in PDF format are preferred, however at least four (4) printed sets of each submittal are acceptable
- A. Provide submittals for the following products/divisions only as applicable to this project:
- Millwork 2. Doors, frames, and hardware
- 3. Operable Partitions
- 4. All materials and finishes specified in Division 9 (physical samples-must be submitted for approval)
- Fire protection
- Plumbing 7. HVAC
- Electrical
- B. Alternates and/or variations from specified materials/systems must be clearly identified as such as part of the submittal package. In cases where alternates and/or variations are not clearly identified, the General Contractor assumes all responsibility for acceptability and performance.
- 1.6 Contractor is responsible for safety on site and shall comply with all applicable regulations.
- 1.7 Administrative Requirements:
  - A. Administration of Contract: Provide administrative requirements for the proper coordination and completion of work including the following:
  - Supervisory personnel:
  - a. Project Manager to serve as point of contact for all project related communication.
  - b. Full time Site Superintendent
  - B. Preconstruction conference.
  - C. Project meetings: Two on-site meetings with architect to review items listed below; GC shall prepare and distribute
  - minutes. GC shall confirm with architect 1 week in advance for the completion of work listed below. 1. Initial evaluation of layout and introduction
  - 2. Framing / box walk to identify rough boxes for power, tele/data boxes, and in-wall blocking, prior to GWB
  - installation. 3. Paint, and miscellaneous items.
  - 4. Over-all evaluation and clarifications
  - 5. Punch walk all work including final clean must be completed prior to this meeting.
  - D. Work Schedule: Contractor is responsible for preparing and maintaining a written, graphic schedule for the duration of the Project. Acceptable formats include Microsoft Project or FastTrack Schedule. Other formats may be submitted to the Architect for consideration. Project schedule is to be updated to reflect weekly progress.
- E. Schedule of Values: Submit schedule of values following CSI, 16 Division format.
- F. Record Documents: Submit record drawings and specifications; to be maintained and annotated by Contractor as work

#### 1.8 Installation Requirements, General:

- A. Inspect substrates and report unsatisfactory conditions in writing.
- B. Do not proceed until unsatisfactory conditions have been corrected.
- C. Take field measurements prior to fabrication where practical. Form to required shapes and sizes with true edges, lines and angles. Provide inserts and templates as needed for work of other trades.
- D. Install materials in exact accordance with manufacturer's instructions and approved submittals.
- E. Install materials in proper relation with adjacent construction and with proper appearance.
- F. Restore units damaged during installation. Replace units which cannot be restored at no additional expense to the
- G. Refer to additional installation requirements and tolerances specified under individual specification sections.
- I. Provide: Furnish and install, complete with all necessary accessories, ready for intended use, Pay for all related costs,
- J. Approved: Acceptance of item submitted for approval. Not a limitation or release for compliance with the Contract Documents or regulatory requirements. Refer to limitations of 'Approved' in General and Supplementary Conditions.
- K. Match Existing: Match existing as acceptable to the Owner.
- L. Intent: Drawings and specifications are intended to provide the basis for proper completion of the work suitable for the intended use of the Owner. Anything not expressly set forth but which is reasonable implied or necessary for proper performance of the project shall be included.

# 1.9 Substitutions:

A. Where alternate materials or products are allowed by note or specification and/or the Contractor wishes to propose a substitute, the proposed substitute shall be submitted to the Architect, with sufficient product data, samples, comparative cost information as other materials as needed to evaluate the alternate. Proposed alternates are to be

identified as part of bid package. Alternates identified following submittal of bid may not be considered.

- B. Substitution Requests: Identify product or fabrication or installation method to be replaced. Include Specification Section
- number and title and Drawing numbers and titles 1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
- a. Statement indicating why specified material or product cannot be provided. b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed
- c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features
- and requirements indicated. d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
- e. Samples, where applicable or requested.
- f. List of similar installations for completed projects with project
- g. names and addresses and names and addresses of architects and owners.
- h. Material test reports from a qualifi ed testing agency indicating and interpreting test results for compliance with requirements indicated.
- i. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction
- j. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack
- of availability or delays in delivery. k. Cost information, including a proposal of change, if any, in the Contract Sum.
- I. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
- m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results. 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within
- 3 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 5 days of receipt of request, or 5 days of receipt of additional information or documentation, whichever is later.
- a. Form of Acceptance: Architect's Supplemental Information (ASI).
- b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated. 1.10 Execution Requirements: Substantial Completion:
- A. The following are prerequisites to substantial completion. Provide the following.
- 1. Punch list prepared by Contractor and sub-Contractors as applicable.
- 2. Supporting documentation. Warranties.
- Certifications. Occupancy permit.
- 6. Start-up and testing of building systems.
- 7. Change-over of locks.
- Meter readings. 9. Commissioning documentation.
- B. Final Acceptance: Provide the following prerequisites to final acceptance.
- 1. Final payment request with supporting affidavits.

- 2. Completed punch list.
- C. Project Closeout: Provide the following during project closeout.
- 1. As-Built Drawings: Provide a marked-up set of drawings including
- 2. changes, which occurred during construction.
- 3. Submission of record documents.
- 4. Submission of maintenance manuals.
- 5. Training and turnover to Owner's personnel. 6. Final cleaning and touch-up.
- 7. Removal of temporary facilities.

#### 1.11 Selective Demolition:

- A. Demolition work indicated is approximate. Every effort has been made to fully represent the scope of work involved. However, contractor will visit the site prior to bidding and verify this information and make appropriate adjustments based on field conditions and their plan of work.
- B. Contractor will meet with gsa project manager to discuss salvage and storage of any items to be reused.
- C. Provide containment during demolition to prevent dust from migrating to other areas
- D. Coordinate noisy or dust producing activities with gsa project manager and building manager. Conduct selective demolition so lab operations will not be disrupted.
- E. Notify gsa project manager of discrepancies between existing conditions and drawings before proceeding with selective
- F. HAZARDOUS MATERIALS: It is not expected that hazardous materials will be encountered in the work. If suspected hazardous materials are encountered, do not disturb; immediately notify gsa project manager. Hazardous materials will be removed under a separate contract.
- G. Maintain fire-protection facilities in service during selective demolition operations.
- H. SITE ACCESS AND TEMPORARY CONTROLS: Conduct selective demolition and debris-removal operations to ensure minimum interference with hallways, and other adjacent occupied and used facilities.
- TEMPORARY FACILITIES: Provide temporary barricades and other protection required to prevent injury to people and
- damage to adjacent buildings and facilities to remain.
- J. Demolish and remove existing construction only to the extent required by new construction and as indicated. use methods required to complete the work within limitations of governing regulations and as follows:
  - 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily
- 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces. 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
- 4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on
- supporting walls, floors, or framing.
- 5. Dispose of demolished items and materials promptly.
- K. Removed and reinstalled items:
- 1. Clean and repair items to functional condition adequate for intended reuse.
- 2. Pack or crate items after cleaning and repairing. identify contents of containers.
- 3. Protect items from damage during transport and storage.
- 4. Reinstall items in locations indicated. comply with installation requirements for new materials and equipment. provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- L. EXISTING ITEMS TO REMAIN: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by architect, items may be removed to a suitable, protected storage location during selective demolition cleaned and reinstalled in their original locations after selective demolition operations are complete.
- M. Disposal of demolished materials:
- 1. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain owner's property, remove demolished materials from project site and legally dispose of them in an epa-approved
- 2. Do not allow demolished materials to accumulate on-site.remove trash and debris from site daily.
- 3. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas. 4. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade
- N. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

O. Refer to mechanical, plumbing, & electrical drawings for full extent of demolition work related to those areas

manner that allows any operating facility to maintain a 100% level of operation and cleanliness.

P. PROTECTION OF COMMON AREAS: Lobbies and common corridors shall be provided with flooring protection. Portions of the work may be required on weekends and after normal working hours. Coordinate schedules with the PPLD Project Manager/Facilities Manager listed on the cover page under Project Team. General contractor shall verify and ensure that exit egress is maintained throughout construction. Contractor shall perform the work in a

# **Division 2 - Site Work**

# Division 3 - Concrete

No requirements

No Requirements

# Division 4 - Masonry

No requirements

- **Division 5 Miscellaneous Metals**
- 5.1 Provide miscellaneous metal materials and fabrications as shown or as necessary to complete the work. 5.2 Light-gauge steel studs for interior, non-bearing partitions shall be - 3-5/8" studs, 25 gauge, spaced at 24" OC, unless noted otherwise. Provide backing as required for all built-in items, including cabinetry, etc
- 5.3 All metal stud partitions at designated exit corridors or demising walls shall extend, full-height, to underside of deck. Provide slip track at head of wall, see Details. See reflected ceiling plan.
- 5.4 All metal stud partitions within the remodel area shall extend a minimum of 6" above the ceiling height and shall be braced to the underside of deck or structure as required to properly stabilize the partition.

# Division 6 : Architectural Casework

Division 7 - Thermal and Moisture Protection 7.1 SOUND ATTENUATION BATT INSULATION:

3. Location: See drawings

- 1. Manufacturer: Owens-Corning (<u>www.owenscorning.com</u>, 800.4387465), or approved equal.
  - 2. Thickness: 3 ½" in wall and 6" in ceiling

#### **Division 8 - Doors and Windows** 8.1 METAL DOOR FRAMES:

No requirements

- 1. Manufacturer: Ceco (www.cecodoor.com), or approved equal.
- 2. Style: Fully welded, or in existing openings- knock down hollow metal, standard 18 gauge cold rolled steel. 3. Finish: Factory primed, field paint with semi-gloss sheen to match ADJ wall, color to be selected by Architect.
- 8.2 FLUSH WOOD DOORS: 1. Manufacturer: V-T Industries, Inc. (www.vtindustries.com, 800.827.1615), or approved equal.
  - 2. Style: Solid particleboard/Agrifiber core

5. Finish: Factory prefinished to match existing

3. Face Veneer and Veneer Type: Match existing doors in Suite 4. Sizes: See Floor Plan

- 9.1 Finish Preparation: Provide all surface preparation for the proper installation of finishes per manufacturer's recommendations or, in the absence of available manufacture's recommendations, follow industry quality standards. 9.2 GYPSUM WALLBOARD
  - A. ASTM C 36, in thickness indicated on plans, with manufacturer's standard edges.

- All gypsum wallboard at restroom areas shall be water resistant.
- 2. Finish: Provide smooth, Level 5 finish at all gypsum wallboard walls, unless noted otherwise.

#### 9.4 PAINT:

- A. Manufacturer: Sherwin Williams
- B. Color: Per Finish Plan
- C. Sheen: Partitions: Eggshell
- 2. Wood & Steel: Semi-gloss
- 3. Gypsum Wall Board Ceilings: Flat 4. Application: Two (2) coats over primer.
- 5. Excess material quantity: Provide one (1) unopened pint of each approved color for future maintenance and/or

# 9.7 RESILIENT WALL BASE (COIL-TYPE) AND FLOOR TRANSITION STRIPS:

- 1. Manufacturer: Johnsonite, or approved equal
- Material: Rubber
- 3. Color: See Finish Schedule. Transition strips to match wall base color unless noted otherwise.
- 4. Size: 4" Coil Stock. 4' length not acceptable unless otherwise specified. 5. Profile: Cove base

9.8 TILE CARPETING

- A. MATERIALS
- 1. Install from Owner Stock. provide all accessories and Adhesives for complete installation.
- B. QUALITY ASSURANCE 1. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who
- can demonstrate compliance with its certification program requirements. 2. Product Options: Products and manufacturers named in Part 2 will be accepted only. NO SUBSTITUTIONS WILL BE CONSIDERED.

- D. PROJECT CONDITIONS
- 1. General: Comply with CRI 104, Section 6.1, "Site Conditions; Temperature and Humidity." 2. Environmental Limitations: Do not install carpet tile until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its
- 3. Do not install carpet tile over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

Where demountable partitions or other items are indicated for installation on top of carpet tile, install carpet tile

before installing these items

holes, and depressions in substrates.

- E. INSTALLATION ACCESSORIES Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided by
  - or recommended by carpet tile manufacturer
- Adhesives: As recommended by carpet tile manufacturer. 3. Examine substrates, areas, and conditions for compliance with requirements for maximum moisture content,
- alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Verify that substrates and conditions are satisfactory for carpet tile installation and comply with requirements specified. 4. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:

a. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere

- with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet tile manufacturer.
- b. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits. 5. Proceed with installation only after unsatisfactory conditions have been corrected.

- General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and carpet tile manufacturer's
- written installation instructions for preparing substrates indicated to receive carpet tile installation. 2. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks,
- 3. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and by carpet tile manufacturer. 4. Broom and vacuum clean substrates to be covered immediately before installing carpet tile. After cleaning,

examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after

# unsatisfactory conditions have been corrected.

- D. INSTALLATION
- General: Comply with CRI 104, Section 13, "Carpet Modules (Tiles)." Installation Method: As recommended in writing by carpet tile manufacturer. 3. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including

5. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on

- cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile
- 4. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

manufacturer.

manufacturer.

6. Install pattern parallel to walls and borders. E. CLEANING AND PROTECTION

b. Remove yarns that protrude from carpet tile surface.

- 1. Perform the following operations immediately after installing carpet tile: a. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile
- c. Vacuum carpet tile using commercial machine with face-beater element. Protect installed carpet tile to comply with CRI 104, Section 15, "Protection of Indoor Installations." 3. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during

the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile

# DESIGN EDGE

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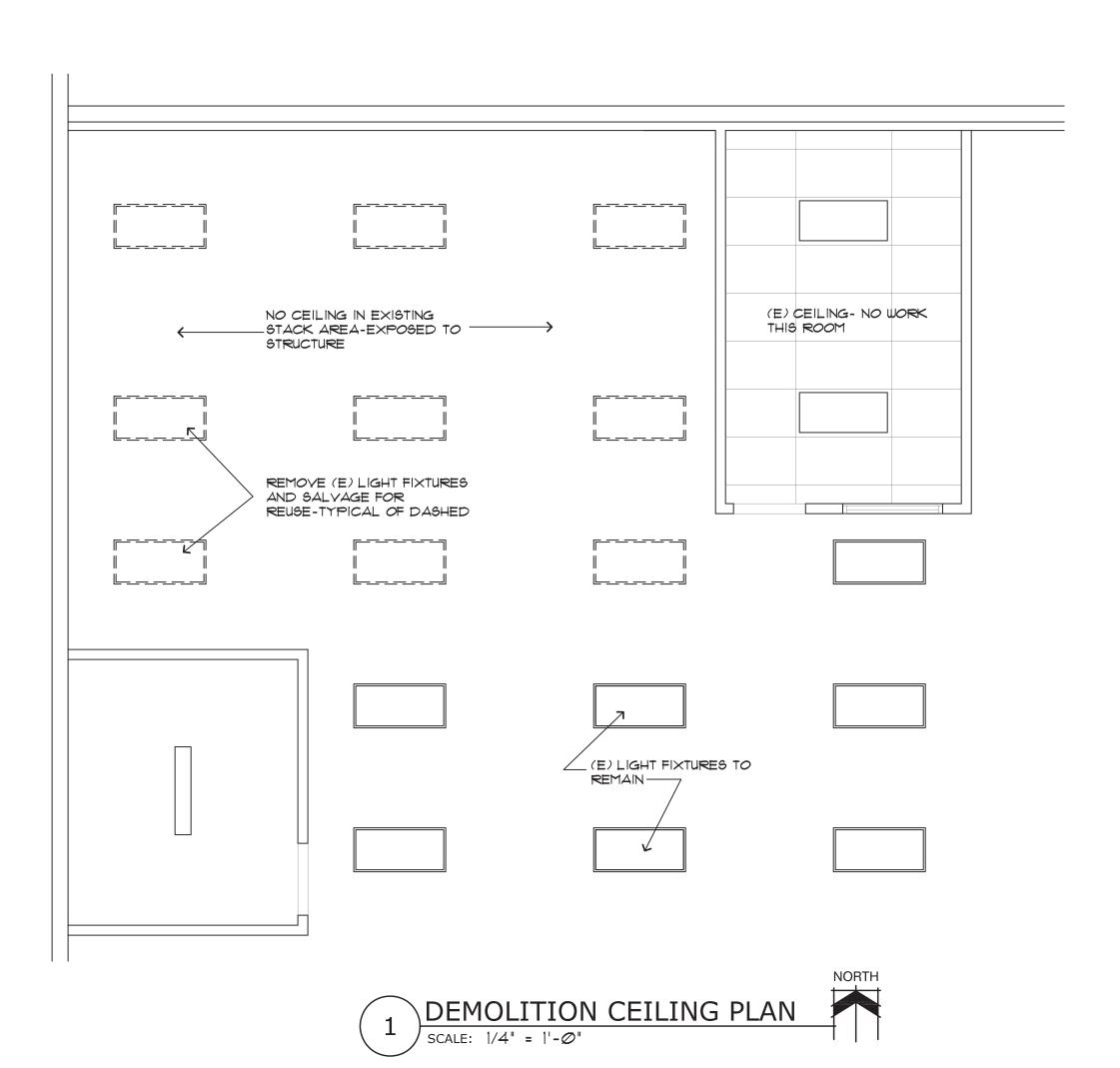
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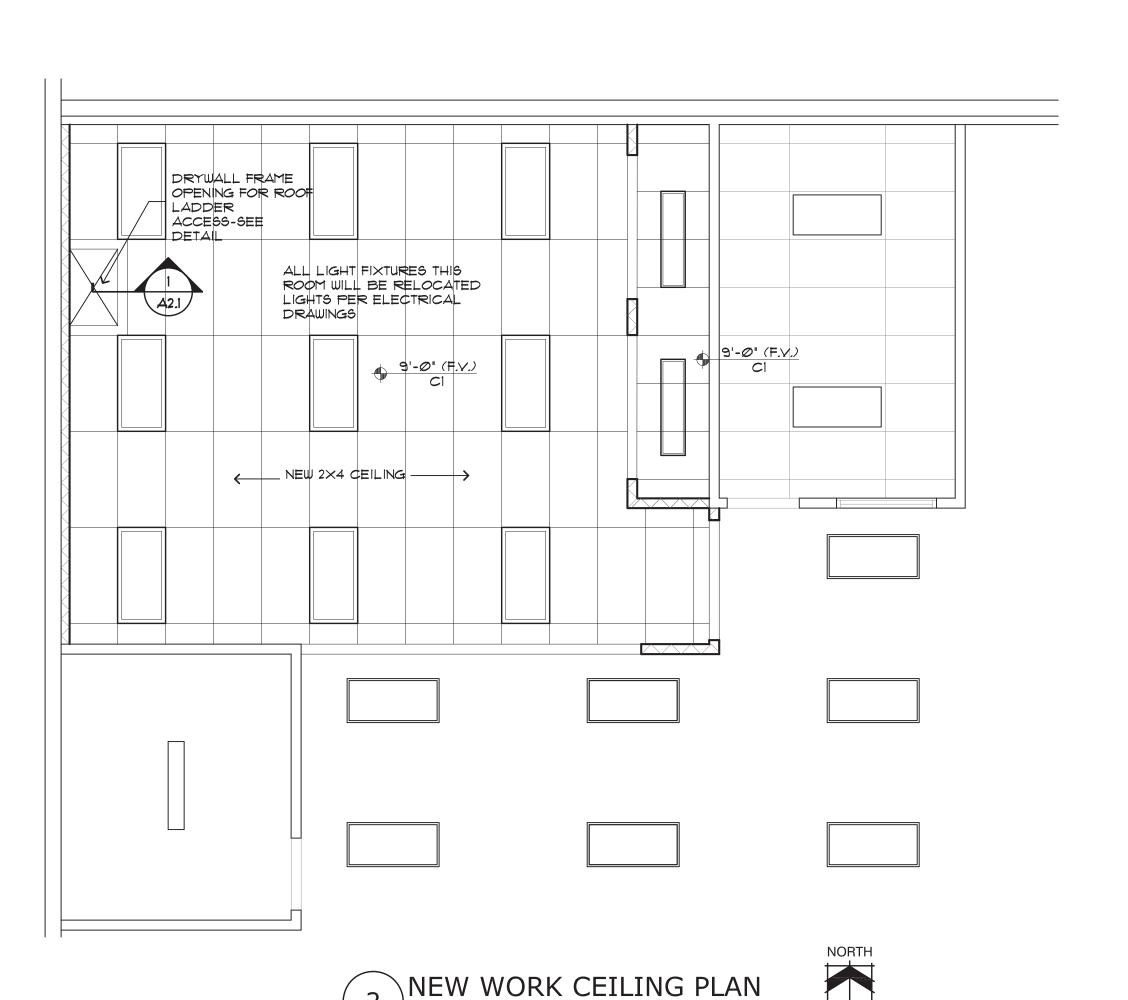
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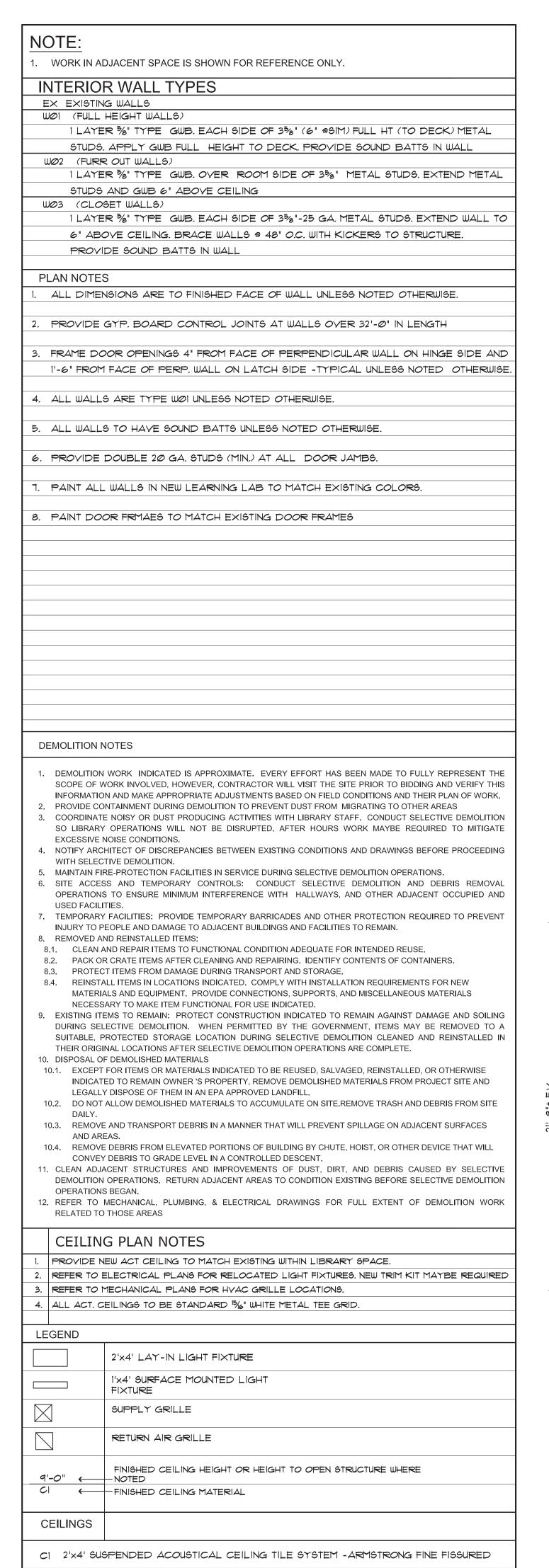
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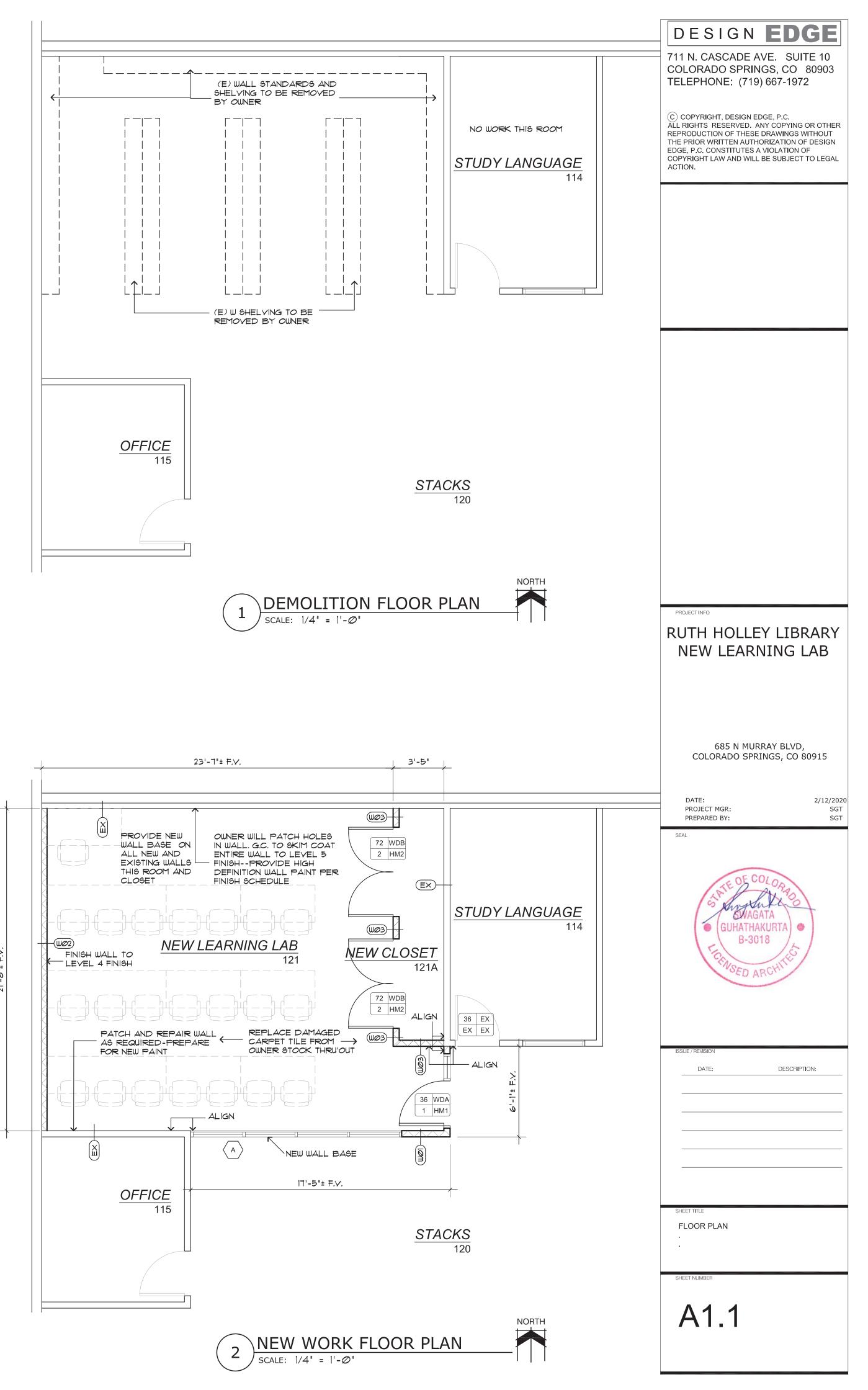
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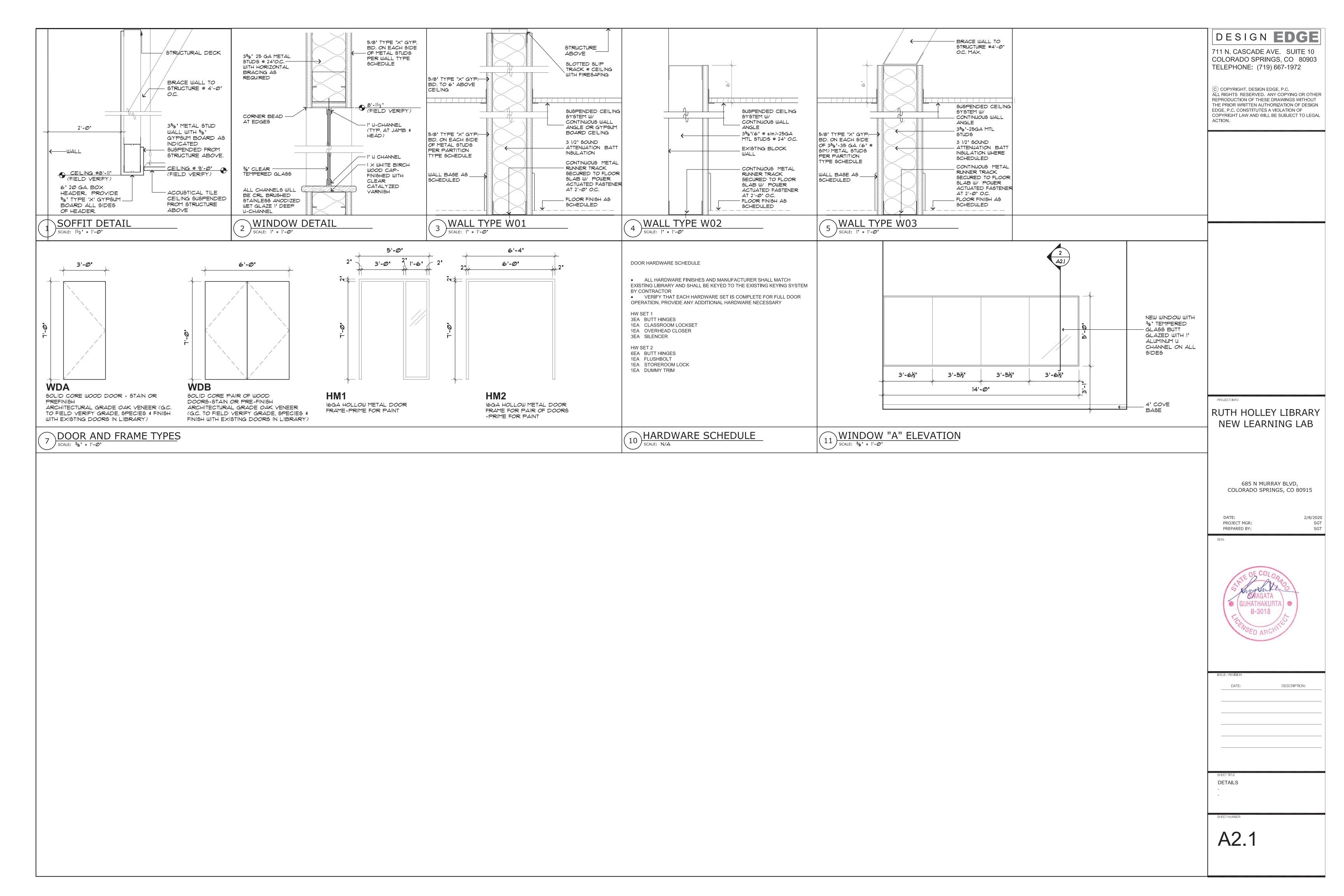
**ARCHITECTURAL SPECIFICATIONS** 











	MECHANICAL LEGEND															
SYM DOUBLE	BOL SINGLE	ABBR	DESCRIPTION	SYMBOL	ABBR	DESCRIPTION	SYMBOLS LISTED BELOW A	ABBR	DESCRIPTION	SYMBOL	ABBR	DESCRIPTION	ABBR	ABBREVIA DESCRIPTION	ATIONS:	DESCRIPTION
HVAC:	<b>⊢</b>	RA	RETURN DUCT UP	AIR TERMINALS:		SUPPLY DIFFUSER 4-WAY THROW	PIPING:	HWS	HEATING WATER SUPPLY	FITTINGS: - 무	P&T	PRESSURE/ TEMPERATURE PORT TAPS	AF AFF	AFTER FILTER  ABOVE FINISHED FLOOR	LVG MA	LEAVING MAKE-UP AIR
	<b>∠</b>	SA OA	SUPPLY DUCT UP OUTSIDE AIR DUCT UP	<b>←</b> ⋈ <b>→</b>		SUPPLY DIFFUSER 3-WAY THROW		HWR	HEATING WATER RETURN	<b>→</b>	CR	CONCENTRIC REDUCER	AFG	ABOVE FINISHED GRADE	MAX MCA	MAXIMUM MINIMUM CIRCUIT AMPACITY
	Ţ	EA	EXHAUST DUCT UP	<b>←</b> □		SUPPLY DIFFUSER 2-WAY THROW		HTWS	HIGH TEMP. HOT WATER SUPPLY		ER	ECCENTRIC REDUCER	AHU	AIR HANDLING UNIT  ALUMINUM	MBH MCC	THOUSAND BTUH MOTOR CONTROL
	<u> </u>	RA	RETURN DUCT DN			SUPPLY DIFFUSER 1-WAY THROW		HTWR	HIGH TEMP. HOT WATER RETURN	<b>→</b>   <b>→</b>	U	UNION	AMB. AP B	AMBIENT ACCESS PANEL BOILER	MIN MOCP	CENTER  MINIMUM  MAX OVER
	₩	SA OA	SUPPLY DUCT DN OUTSIDE AIR DUCT DN			SUPPLY SLOT DIFFUSER		LPS	LOW PRESSURE STEAM SUPPLY		EJ	EXPANSION JOINT	ВНР	BRAKE HORSE POWER	MTL	CURRENT PROTECTION METAL
	$\vdash \square$	EA	EXHAUST DUCT DN			RETURN AIR GRILLE		MPS	MEDIUM PRESSURE STEAM SUPPLY		AC	ALIGNMENT GUIDE	BOD BTUH	BOTTOM OF DUCT BRITISH THERMAL UNIT PER HOUR	NC (N)	NOISE CRITERIA NEW
	$\succ\!$		ROUND DUCT UP			EXHAST AIR GRILLE		HPS	HIGH PRESSURE STEAM SUPPLY	_ <del>×</del>	AN	PIPE ANCHOR	CAV	CONSTANT AIR VOLUME COOLING COIL	NTS OA	NOT TO SCALE OUTSIDE AIR
	$\widetilde{\Theta}$		ROUND DUCT DN		AP	CEILING ACCESS PANEL		LPR	LOW PRESSURE STEAM CONDENSATE RETURN	⊣‱⊢	FC	FLEXIBLE PIPE CONNECTOR	CFH	CUBIC FEET PER HOUR		ON CENTER OPENING
	<b>—</b>		ROUND DUCT RISE	•		UNDERFLOOR SWIRL DIFFUSER		MPR	MEDIUM PRESSURE STEAM CONDENSATE RETURN	<u> </u>	FS	FLOW SWITCH	CFM CH	CUBIC FEET PER MINUTE CHILLER		PUMP PRESSURE DROP/ DIFFERENTIAL
	<b>—</b>		ROUND DUCT DROP	VALVES:	GV	GATE VALVE		HPR	HIGH PRESSURE STEAM CONDENSATE RETURN	<u> Рр</u>	PS	PRESSURE SWITCH	СОР	COEFFICIENT OF PERFORMANCE		PRE-FILTER PRESSURE
	<b>—</b>		RADIUS ELBOW DUCT RISE	<b>—</b>	CV	CHECK VALVE		PR	PUMPED CONDENSATE RETURN	<u></u>	PG	PRESSURE GAUGE W/ GAUGE COCK	CRU	CONDENSATE RETURN UNIT CONSTANT VOLUME	PSIG	POUNDS PER SQUARE INCH GAUGE
	<b>⊢</b>		RADIUS ELBOW DUCT DROP	<b></b> >>	PRV	PRESSURE REDUCING VALVE		BD	BOILER BLOW DOWN	-⊗-		STEAM TRAP	dB DB	DECIBEL DRY-BULB	PWL QTY	SOUND POWERLEVEL QUANTITY
<b>□</b>	<del></del>		MITRED ELBOW DUCT RISE	<b>—</b> ×	BLV	BALANCING VALVE		BF	BOILER FEED	<u> </u>		ELBOW UP	DDC DEFL	DIRECT-DIGITAL CONTROL DEFLECTION	(R)	RETURN AIR RELOCATE
	<b>—</b>		MITRED ELBOW DUCT DROP	<del></del>	GLV	GLOBE VALVE (STRAIGHT PATTERN)		ВО	BLOW OFF	<u>C</u>		ELBOW DN	DIA DN	DIAMTER DOWN	REF RF RH	REFERENCE RETURN FAN RELATIVE HUMIDITY
			MITRED ELBOW	— <del>-</del>	GLV	GLOBE VALVE (ANGLE PATTERN)		CF	CHEMICAL FEED	<b>─</b>		TEE UP	DP DWG	DISCHARGE PLENUM DRAWING	RLA RPM	RUNNING LOAD AMPS REVOLUTION PER MIN.
(333)	4		VANED ELBOW	<del></del>	BFV	BUTTERFLY VALVE		DR	EQUIPMENT DRAIN	-		TEE DN	EA EDR	EXHAUST AIR  EFFECTIVE DIRECT  RADIATION	RQD	REQUIRED SUPPLY AIR
0			RADIUS ELBOW	<del></del>	BV	BALL VALVE		D	INDIRECT DRAIN	SYMBOLS:  A SIZE (X)		AIR TERMINAL CALLOUT, TYP (X) DEVICES	EER	ENERGY EFFICIENCY RATIO	SCFM	STANDARD AIR CUBIC FEET PER MINUTE
	$\vdash \!$		RECTTO-ROUND DUCT TRANSITION	<del></del>	PV	PLUG VALVE		SCW	SOFT COLD WATER	- 1i		MECHANICAL EQUIPMENT TAG (POWERED)	EFF ENT	EXHAUST FAN EFFICIENCY ENTERING		SUPPLY FAN SHEET
Ü	$\vdash \supset \vdash$		DUCT TRANSITION	<del></del>	DV	HOSE END DRAIN VALVE		А	CONTROL AIR (PNEUMATIC)	- 1i		MECHANICAL EQUIPMENT TAG (NON-POWERED)	ESP	EXTERNAL STATIC PRESSURE		SPECIFICATIONS STATIC PRESSURE
	<b></b>		CAPPED DUCT		TCV	AUTOMATIC TEMP. CONTROL VALVE, 2-WAY		CHWS	CHILLED WATER SUPPLY	<b>→</b> ^-		RETURN/EXHAUST AIR FLOW SYMBOL	(E) *F	EXISTING  DEGREE FAHRENHEIT		SQUARE SQUARE FOOT
<u> </u>	$\leftarrow - \rightarrow$		EXISTING DUCT NO CHANGE	— <u>\</u>	TCV	AUTOMATIC TEMP. CONTROL VALVE, 3-WAY		CHWR	CHILLED WATER RETURN	-		SUPPLY AIR FLOW SYMBOL	FCU F.G.	FAN COIL UNIT FIBERGLASS	SS ST TG	STAINLESS STEEL SOUND TRAP TRANSFER GRILLE
	\// <i>\</i>		EXISTING DUCT TO BE REMOVED		SV	SOLENOID VALVE		cws	CONDENSER WATER SUPPLY	1 A101		SECTION MARKER	FF FLA	FINAL FILTER FULL LOAD AMPS	TOD	TOP OF DUCT TOTAL STATIC
$\Diamond$	<b>~</b>	FSD	FIRE SMOKE DAMPER		TPR	TEMPERATURE/ PRESSURE RELIEF VALVE		CWR	CONDENSER WATER RETURN	1 A101 SIM		DIAGRAM CALLOUT	FPI FPM	FINS PER INCH FEET PER MINUTE	TYP	PRESSURE TYPICAL
$\Box$	**	FD	FIRE DAMPER	——————————————————————————————————————	STR	STRAINER W/ BLOW- OFF VAVLVE & CAPPED HOSE END		PCS	PROCESS COOLING WATER SUPPLY	0		SHEET KEY NOTE	FRIC.	FLASH TANK		UNLESS OTHERWISE NOTED UP THRU ROOF
	+	SD	SMOKE DAMPER		FV	FLOW VENTURI		PCR	PROCESS COOLING WATER RETURN	T		THERMOSTAT	FS FT. W	FLOOR SINK C. FEET WATER COLUMN	VAV VEL	VARIABLE AIR VOLUME VELOCITY
[ ]	<u>M</u>	MD	MOTORIZED DAMPER	Q	SD	SUCTION DIFFUSER		RS	REFRIGERANT SUCTION	TS		SPACE TEMPERATURE SENSOR	GAL GPH	GALLONS PER HOUR	VFD	VARIABLE FREQUENCY DRIVE
		MVD	MANUAL VOLUME DAMPER W/ LOCKING QUADRANT					RL	REFRIGERANT LIQUID	Н		HUMIDISTAT	GPM HC	GALLONS PER MINUTE HEATING COIL		VARIABLE SPEED DRIVE VENT THRU ROOF
	<b>∓</b>		CONICAL SPIN-IN FITTING W/ MANUAL VOLUME DAMPER					RL	REFRIGERANT LIQUID	PS		SPACE PRESSURE SENSOR	HP HU HZ	HORSEPOWER HUMIDIFIER HERTZ	WB WF	WET-BULB WATER FILTRATION
	ightharpoons		CONICAL TAP	PIPING:		SUPPLY PIPING (TYPE ABBR. AND DESCR. NEXT COLUMN)		G	LOW PRESSURE GAS (0.5 PSI OR LESS)	CD		CARBON DIOXIDE SENSOR	IN. W	C. INCHES WATER COLUMN		WITH WITHOUT
	<b>‡</b>	FC	FLEXIBLE DUCT CONNECTOR	<b>≻</b>		RETURN PIPING (TYPE ABBR. AND DESCR. NEXT COLUMN)		MG	MEDIUM PRESSURE GAS (0.5 TO 2 PSI)	(0)		CARBON MONOXIDE SENSOR	ISOL. KW	ISOLATOR KILOWATTS		
$\sim$	~		LOW PRESSURE FLEXIBLE DUCT	<i></i>		PIPING TO BE REMOVED				<u> </u>		DUCT MOUNTED SMOKE DETECTOR	LBS LBS/H	POUNDS R POUNDS PER HOUR		



# DESIGN EDGE

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PROJECT INFO

RUTH HOLLEY LIBRARY
NEW LEARNING LAB

685 N MURRAY BLVD, COLORADO SPRINGS, CO 80915

02/07/2020

DATE: PROJECT MGR: PREPARED BY:

ORADO LICENS

ISS	SUE / REVISION	
	DATE:	DESCRIPTION:

SHEET TITLE

MECHANICAL LEGEND

SHEET NUM

**MO 1** 

#### BASIC MECHANICAL REQUIREMENTS

CONDITIONS

1.1. UNLESS OTHERWISE NOTED, THE WORK DESCRIBED ON THE PLANS AND SPECIFICATIONS SHALL INCLUDE THE FURNISHING AND INSTALLATION OF ALL LABOR AND MATERIALS NECESSARY FOR COMPLETE AND OPERATIONAL HVAC PLUMBING SYSTEMS. CONTRACTOR SHALL FURNISH THESE EVEN IF ITEMS REQUIRED TO ACHIEVE THIS (I.E. OFFSETS, ISOLATION AND BALANCING DEVICES, MAINTENANCE CLEARANCES, ETC.) ARE NOT SPECIFICALLY

1.2. ALL CAPACITIES ARE SCHEDULED AT A JOBSITE ALTITUDE OF 6200 FT ABOVE SEA LEVEL

2. CODES AND REGULATIONS 2.1. COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES, REGULATIONS AND ORDINANCES, AND THE LATEST APPLICABLE REQUIREMENTS OF THE 2015 INTERNATIONAL BUILDING, MECHANICAL AND ENERGY CONSERVATION CODES, LATEST EDITIONS OF NFPA, PPRBD REGIONAL AMENDMENTS, AND REGULATIONS OF THE UTILITY COMPANY FURNISHING SERVICE AS INTERPRETED BY THE LOCAL INSPECTION AUTHORITY WHO SHALL HAVE FINAL JURISDICTION.

2.2. COMPLY ALSO WITH ALL OSHA REQUIREMENTS AND DIRECTIVES.

DEFINITIONS 3.1. DEFINITIONS OF DIVISION 1 AND GENERAL CONDITIONS OF THIS SPECIFICATION ALSO APPLY TO DIVISIONS 21-23 CONTRACT.

3.2. "PROCUREMENT REQUIREMENTS" CONSTITUTE THE SOLICITATION, INSTRUCTIONS FOR PROCUREMENT, AVAILABLE INFORMATION, AND

PROCUREMENT FORMS AND SUPPLEMENTS. 3.3. "CONTRACT DOCUMENTS" CONSTITUTE THE CONTRACTING REQUIREMENTS, SPECIFICATIONS, CONTRACT DRAWINGS, PRE-CONTRACT REVISIONS (ADDENDA), CLARIFICATIONS AND PROPOSALS, AND CONTRACT MODIFICATIONS PREPARED BY ARCHITECT FOR CONTRACTOR'S BID OR

CONTRACTOR'S NEGOTIATIONS WITH THE OWNER. 3.4. "CONSTRUCTION DOCUMENTS" INCLUDE THE "PROCUREMENT REQUIREMENTS", "CONTRACT DOCUMENTS", AND ANY RESOURCE DRAWINGS. 3.5. "CONSTRUCTION SUBMITTALS" AND SIMILAR TERMS FOR DIVISIONS 21-23 WORK REFER TO SHOP DRAWINGS, COORDINATION DRAWINGS, PRODUCT

DATA, SAMPLES, QA/QC SUBMITTALS, INFORMATIONAL SUBMITTALS, AND CONSTRUCTION PHOTOGRAPHS PREPARED BY THE CONTRACTOR THAT CONVEY INFORMATION ABOUT SYSTEMS, EQUIPMENT, MATERIALS, PRODUCTS, AND ADMINISTRATIVE MATTERS, AND ARE NOT CONSIDERED CONSTRUCTION DOCUMENTS.

3.6. "(N)" INDICATES "NEW" EQUIPMENT TO BE PROVIDED UNDER THIS CONTRACT.

3.7. "(E)" INDICATES "EXISTING" EQUIPMENT ON SITE WHICH MAY OR MAY NOT NEED TO BE RELOCATED AS A PART OF THIS WORK.

3.8. "(R)" INDICATES EXISTING EQUIPMENT TO BE RELOCATED AS PART OF THIS WORK. 3.9. "FURNISH" MEANS TO "SUPPLY" AND USUALLY REFERS TO AN ITEM OF EQUIPMENT.

3.10. "INSTALL" MEANS TO "SET IN PLACE, CONNECT AND PLACE IN FULL OPERATIONAL ORDER".

3.11. "PROVIDE" MEANS TO "FURNISH AND INSTALL"

3.12. "EQUIVALENT" MEANS "MEETS THE SPECIFICATIONS OF THE REFERENCE PRODUCT OR ITEM IN ALL SIGNIFICANT ASPECTS." SIGNIFICANT ASPECTS SHALL BE AS DETERMINED BY THE ARCHITECT.

3.13. "WORK BY OTHER(S) DIVISIONS"; "RE: DIVISION", AND SIMILAR EXPRESSIONS MEAN WORK TO BE PERFORMED UNDER THE CONTRACT DOCUMENTS, BUT NOT NECESSARILY UNDER THE DIVISION OR SECTION OF THE WORK ON WHICH THE NOTE APPEARS. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO COORDINATE WORK OF THE CONTRACT BETWEEN HIS/HER SUPPLIERS, SUBCONTRACTORS AND EMPLOYEES. IF CLARIFICATION IS REQUIRED, CONSULT ARCHITECT BEFORE SUBMITTING BID.

3.14.BY INFERENCE, ANY REFERENCE TO A "CONTRACTOR" OR "SUB-CONTRACTOR" MEANS THE ENTITY WHICH HAS CONTRACTED WITH THE OWNER FOR THE WORK OF THE CONTRACT DOCUMENTS.

3.15. "ENGINEER" MEANS THE DESIGN PROFESSIONAL FIRM WHICH HAS PREPARED THESE CONTRACT DOCUMENTS. ALL QUESTIONS, SUBMITTALS, ETC. OF THIS DIVISION SHALL BE ROUTED TO THE ARCHITECT THROUGH PROPER CONTRACTUAL CHANNELS.

4. DRAWINGS AND SPECIFICATIONS 4.1. DRAWINGS ARE DIAGRAMMATIC IN NATURE AND SHALL NOT BE SCALED. THEY SHOW CERTAIN PHYSICAL RELATIONSHIPS WHICH MUST BE ESTABLISHED WITHIN THE DIVISIONS 21-23 WORK AND ITS INTERFACE WITH OTHER WORK. ESTABLISHING THIS RELATIONSHIP IN THE FIELD IS THE

EXCLUSIVE RESPONSIBILITY OF THE CONTRACTOR. THIS DIVISION SHALL COORDINATE ITS WORK WITH ALL DIVISIONS OF THE WORK AND ADJUST ITS WORK AS REQUIRED BY ACTUAL CONDITIONS OF THE PROJECT. 4.1.1. THE CONTRACTOR SHALL VISIT THE SITE BEFORE SUBMITTING A BID TO BECOME THOROUGHLY FAMILIAR WITH THE ACTUAL CONDITIONS OF

4.1.2. CERTAIN SYSTEMS REQUIRE ENGINEERING OF INSTALLATION DETAILS BY CONTRACTOR. UNLESS FULLY DETAILED IN THE CONTRACT DOCUMENTS, SUCH ENGINEERING IS THE EXCLUSIVE RESPONSIBILITY OF THE CONTRACTOR. 4.1.3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE WHERE CLEARANCES ARE LIMITED, AND WHERE INSTALLATION DRAWINGS OR

SCHEMATICS, "CONSTRUCTION DRAWINGS", OR COORDINATION DRAWINGS MAY BE REQUIRED. THE CONTRACTOR SHALL PREPARE ALL SUCH COORDINATION DRAWINGS AS PART OF THE BASE CONTRACT. SUCH DRAWINGS MAY BE SUBMITTED TO THE ARCHITECT FOR RECORD AND COMMENT (AT THE CONTRACTOR'S OPTION).

4.2. REFER TO ARCHITECTURAL, STRUCTURAL, ELECTRICAL AND MECHANICAL DRAWINGS AND SPECIFICATIONS, AS A PART OF THIS SET, AND BE RESPONSIBLE FOR ALL INFORMATION CONTAINED THEREIN THAT AFFECTS MECHANICAL WORK. 4.3. LAY OUT ALL WORK IN ADVANCE. DO NOT DEFACE WORK OF OTHER TRADES. SLEEVES AND OPENINGS THROUGH THE ROOF TO BE BY THE BASE BUILDING ROOFING CONTRACTOR.

5.1. SECURE AND PAY FOR ALL PERMITS, FEES, TAXES, LICENSES, UTILITY COMPANY CHARGES AND INSPECTIONS IN CONNECTION WITH THE

6. COORDINATION 6.1. ORDER THE PROGRESS OF THE WORK TO CONFORM TO THE PROGRESS OF OTHER TRADES. COORDINATE ALL ELECTRICAL INSTALLATION AND ROUGH-IN AS REQUIRED.

7.1. PROVIDE A COMPETENT FOREMAN ON THE JOB AT ALL TIMES. ACCOMPLISH ALL WORK IN A NEAT, WORKMANLIKE, FIRST-QUALITY MANNER

COMPATIBLE WITH GOOD COMMERCIAL PRACTICES AND STANDARDS. PROVIDE COMPETENT WORKMEN. 8. SHOP DRAWINGS AND MATERIALS LIST

8.1. SUBMIT COMPLETE MANUFACTURER'S SHOP DRAWINGS AND MATERIAL LISTS FOR APPROVAL OR AS REQUIRED IN DIVISION 1. PRIOR TO SUBMITTING THE SHOP DRAWINGS, REVIEW AND CERTIFY SAME AS TO COMPLIANCE WITH THE PLANS AND SPECIFICATIONS AND FOR DIMENSIONAL SUITABILITY FOR THE APPLICATION. ALL PROPOSED DEVIATIONS FROM SPECIFICATIONS MUST BE CLEARLY LISTED UNDER A PROMINENT HEADING ENTITLED "DEVIATIONS". INCLUDE ALL EQUIPMENT, DUCTWORK, VALVES, PIPING, CONTROLS AND APPURTENANCES. 8.1.1. IF PROJECT PERMITS ELECTRONIC SUBMITTALS, SUBMIT ONE (1) HARD COPY OF CONTROLS, INSTALLATION SHOP DRAWINGS.

TEST-ADJUST-BALANCE REPORTS, AND FIRE PROTECTION DRAWINGSTO ENGINEER FOR REVIEW IN ADDITION TO ELECTRONIC COPIES. 8.2. PROVIDE MATERIAL AS SPECIFIED. SUBSTITUTIONS MAY BE CONSIDERED BEFORE THE CONTRACT DATE AS LONG AS DEDUCT ALTERNATE IS SUBMITTED AT BID TIME. SUBMIT SUBSTITUTIONS SEPARATELY FOR EACH PRODUCT WITH SUPPORTING DATA, DRAWINGS AND SAMPLES AS

8.2.1. ITEMIZED COMPARISON OF THE QUALITIES OF THE PROPOSED SUBSTITUTION WITH THAT SPECIFIED.

8.2.2. CHANGES REQUIRED IN OTHER ELEMENTS OF THE WORK BECAUSE OF THE SUBSTITUTION.

8.2.3. COST DATA COMPARING THE PROPOSED SUBSTITUTION WITH THE PRODUCT SPECIFIED. 8.2.4. THE ARCHITECT WILL BE THE JUDGE OF THE ACCEPTABILITY OF THE PROPOSED SUBSTITUTION.

8.2.5. ALL MATERIALS SHALL BE NEW AND BEAR THE UNDERWRITERS' LABORATORIES, INC. APPROVAL, PROVIDED A STANDARD HAS BEEN ESTABLISHED FOR THE MATERIAL.

8.2.6. ALL EQUIPMENT SHALL MEET OR EXCEED MINIMUM REQUIREMENTS OF SMACNA AND ASHRAE.

9. INSTALLATION 9.1. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH INFORMATION AS INDICATED ON THE DRAWINGS AND IN FULL ACCORD WITH MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS.

10. CUTTING AND PATCHING 10.1. PROVIDE ALL CUTTING, CHANNELING, CHASING, DRILLING, ETC., OPERATIONS AS MAY BE REQUIRED FOR THE MECHANICAL WORK. IN GENERAL, ALL SUCH OPERATIONS SHALL BE HELD TO A MINIMUM.

10.2. ALL PATCHING AND PAINTING SHALL BE DONE BY THE CONTRACTOR. 11. TEMPORARY CONSTRUCTION 11.1. PROVIDE TEMPORARY HEAT AND WATER FOR CONSTRUCTION AS REQUIRED. USE OF EXISTING HEAT AND UTILITIES IS NOT ACCEPTABLE WITHOUT

PRIOR WRITTEN PERMISSION OF THE ARCHITECT. 12. INTERRUPTION OF EXISTING SERVICES 12.1. SHUTDOWN, WHEN NECESSARY, SHALL BE SCHEDULED TWO (2) WEEKS IN ADVANCE WITH THE OWNER AND PERFORMED DURING NON-WORKING HOURS (7:00PM - 6:00AM). INTERRUPTION SHALL BE ONLY AT OWNER APPROVED TIMES.

GUARANTEE 13.1. GUARANTEE ALL MATERIALS, LABOR, WORKMANSHIP AND THE SUCCESSFUL OPERATION OF ALL EQUIPMENT INSTALLED UNDER THIS CONTRACT FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE AGAINST DEFECTS AND FAULTY WORKMANSHIP.

13.2. REPAIR OR REPLACE, AT NO EXPENSE TO THE OWNER, ALL DEFECTS WHICH MAY ARISE DURING THIS TIME DUE TO INFERIOR OR DEFECTIVE MATERIALS, EQUIPMENT OR WORKMANSHIP. 14. RECORD DRAWINGS

14.1. MAINTAIN A COMPLETE SET OF MECHANICAL DRAWINGS AT THE JOB SITE WITH ALL CHANGES TO CONTRACT DOCUMENTS NEATLY MARKED THEREON IN A CONTRASTING COLOR. THIS SHALL BE A SEPARATE SET OF DRAWINGS NOT USED FOR CONSTRUCTION PURPOSES. WHICH SHALL BE KEPT UP TO DATE AS THE JOB PROGRESSES AND SHALL BE MADE AVAILABLE FOR OBSERVATION BY THE ARCHITECT AT ALL TIMES. SUBMIT A COMPLETE RECORD SET OF DRAWINGS INCORPORATING ALL ADDENDUMS. BULLETINS AND INFORMATION REQUESTS TO THE ARCHITECT UPON COMPLETION OF THE PROJECT. PROVIDE ELECTRONIC CAD AND PDF FILES OF RECORD DRAWINGS ALONG WITH HARD COPY OF DRAWINGS.

15. DEMONSTRATION 15.1. DEMONSTRATE THE OPERATION OF ALL SYSTEMS FOR THE OWNER AT A TIME AS DIRECTED BY THE ARCHITECT. PROVIDE TWO (2) HOURS OF INSTRUCTION.

16. MAINTENANCE MANUALS 16.1. PRIOR TO COMPLETION OF PROJECT, SUBMIT FOUR (4) SETS OF OPERATION AND MAINTENANCE MANUALS IN THREE RING BINDERS.

17. EXISTING BUILDING 17.1. THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE EXISTING BUILDING WILL BE OCCUPIED BY THE OWNER DURING

CONSTRUCTION. CONTINUED OPERATION OF THE FACILITY SHALL NOT BE HINDERED BY THIS WORK. THE CONTRACTOR SHALL ACCOUNT FOR ALL ADDITIONAL COSTS WHICH MAY BE INCURRED BY HIM DUE TO THE DIFFICULTY OF WORKING OVER AND AROUND EMPLOYEES, DESKS, EQUIPMENT, ETC.: AND DUE TO THE HOURS OF THE DAY IN WHICH AN AREA MAY BE AVAILABLE WHEN SUBMITTING HIS BID. 17.2. CLEAN ALL SUPPLY, EXHAUST, TRANSFER AND RETURN AIR GRILLES BEING REUSED UNLESS OTHERWISE NOTED.

17.3. VISUALLY INSPECT ALL EXISTING FIRE DAMPERS AND SMOKE/FIRE DAMPERS FOR PROPER POSITION AND ACCESS. REPLACE BROKEN LINKAGES AS REQUIRED. REPORT ANY ADDITIONAL DISCREPANCIES TO THE ARCHITECT IMMEDIATELY. 17.4. MATCH THE MATERIAL AND CONSTRUCTION METHODS OF ALL RELOCATED PIPE, DUCTWORK, CONDUITS, ETC. WHICH ARE TO BE RELOCATED WITH

17.5. DURING DEMOLITION OPERATIONS, ALL PERSONS AND PROPERTY SHALL BE PROTECTED. THE WORK SHALL PROCEED IN SUCH A MANNER SO AS TO MINIMIZE ANY SPREADING OF DUST, DEBRIS AND FLYING PARTICLES, AND SO THAT ANY RELATED EFFECTS OF THE DEMOLITION DO NOT INTERFERE WITH SURROUNDING EQUIPMENT, PERSONNEL OR THE OPERATION OF THE BUILDING.

17.6. MINIMIZE DISRUPTIONS TO MECHANICAL AND ELECTRICAL SYSTEMS IN OCCUPIED AREAS. COORDINATE ANY REQUIRED SYSTEM OUTAGES WITH THE ARCHITECT IN ADVANCE. 18. TENANT FINISH

18.1. NO INCREASE ON CONTRACT SUM WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF EXISTING CONDITIONS. COORDINATE AND ADJUST ALL WORK BETWEEN TRADES AND EXISTING CONDITIONS IN ORDER TO ACCOMPLISH A NEAT, INTEGRATED AND EFFICIENT INSTALLATION. 18.2. EXAMINE THE CONTRACT DOCUMENTS OF ALL TRADES (E.G., THE ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL LIGHTING PLAN, FIRE PROTECTION PLAN. ETC.). 18.3. COORDINATE NECESSARY EQUIPMENT, DUCTWORK AND PIPING LOCATIONS SO THAT THE FINAL INSTALLATION IS COMPATIBLE WITH THE

MATERIALS AND EQUIPMENT OF THE OTHER TRADES.

ELECTRICAL COORDINATION

19.1. VERIFY THE ELECTRICAL SERVICE PROVIDED BY THE ELECTRICAL CONTRACTOR BEFORE ORDERING ANY MECHANICAL EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS. INSTALLATION OR BID OF INCORRECT POWER OR EQUIPMENT SHALL BE REMOVED AND REPLACED WITH CORRECT NEW AT NO INCREASE ON CONTRACT SUM.

19.2. PROVIDE PREMIUM EFFICIENCY MOTORS WITH 1.15 SERVICE FACTOR ON ALL EQUIPMENT 1 HP AND OVER. MOTORS SHALL BE CAPABLE OF OPERATING CONTINUOUSLY AT 1050F UNDER JOBSITE CONDITIONS AND ALTITUDE.

19.3. ALL MOTORS ½ HP OR SMALLER SHALL BE PROVIDED 1-PHASE. ALL OTHER MOTORS SHALL BE PROVIDED 3-PHASE UNLESS OTHERWISE NOTED.

#### BASIC MECHANICAL MATERIALS AND METHODS

PRODUCTS

1.1. ACCESS PANELS.

1.1.1. REFER TO ARCHITECTURAL DOCUMENTS FOR FINISHES AND PANEL TYPES. 1.1.2. DOORS SHALL BE A MINIMUM OF 16 GAUGE STEEL, UNLESS REQUIRED OTHERWISE FOR FIRE RATING.

1.1.3. PROVIDE WITH CONCEALED OR FLUSH MOUNT LATCHES.

1.1.4. PROVIDE WITH FIRE RATING EQUIVALENT TO CONSTRUCTION WHICH INSTALLED. 1.2. FIRE-STOPPING MATERIALS.

1.2.1. PRODUCTS TO BE USED SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ASTM E 814-88, "AND UL 1479 TEST METHOD FOR THROUGH PENETRATIONS", AND BE LISTED IN THE UL FIRE RESISTANCE DIRECTORY. 1.2.2. PROVIDE FASTENERS, RESTRICTING COLLARS, BACKING MATERIALS, AND PROTECTIVE COATINGS AS REQUIRED TO COMPLY WITH THE UL

SYSTEM LISTING APPLICATION

2.1. CUTTING AND PATCHING. 2.1.1. WHERE CUTTING AND PATCHING IS REQUIRED, ARCHITECTURAL REQUIREMENTS GOVERN.

2.1.2. KEEP CUTTING TO A MINIMUM WHERE REQUIRED. 2.1.3. PROVIDE PATCHING TO MATCH EXISTING AT A MINIMUM.

2.1.4. DO NOT CUT OR DRILL THROUGH STRUCTURAL ITEMS WITHOUT WRITTEN APPROVAL FROM THE ARCHITECT. 2.2. ACCESS PANELS

2.2.1. FURNISHED AND LOCATED BY DIVISIONS 21-23, INSTALLED BY TRADE RESPONSIBLE FOR SURFACE IN WHICH IT IS INSTALLED. 2.2.2. COORDINATE EXACT LOCATION WITH ARCHITECT OR ARCHITECTURAL DRAWINGS.

2.3.1. INSTALL FIRESTOPPING MATERIALS IN ACCORDANCE WITH THEIR UL AND ASTM TESTED METHODS. 2.3.2. INSTALL FIRE STOPPING AT ALL PENETRATIONS THROUGH FIRE-RATED CONSTRUCTION.

#### MECHANICAL IDENTIFICATION

LABEL ALL NEW PIPING AND EQUIPMENT.

PROVIDE FULL BAND OR STRIP TYPE MARKERS AND FLOW ARROWS ON PIPING.

PROVIDE ENGRAVED PLASTIC VALVE TAGS WITH VALVE NUMBER AND ATTACH WITH STANDARD CHAIN OR S-HOOKS.

PROVIDE LABELS ON CEILINGS UNDER CONCEALED DEVICES. LABEL EQUIPMENT AS TO THE AREA SERVED.

PROVIDE LABEL COLORS TO COMPLY WITH ANSI A13.1

#### DUCTWORK

1.1. FABRICATE IN ACCORDANCE WITH LATEST EDITION OF SMACNA STANDARDS AND INTERNATIONAL MECHANICAL CODE FOR LOW AND MEDIUM

1.2. GALVANIZED STEEL, PITTSBURGH LOCK LONGITUDINAL SEAMS SEALED AIRTIGHT, DUCTMATE, OR T.D.C. SYSTEM.

1.3. EXPOSED DUCT: SPIRAL GALVANIZED WITH "PAINTLOC" FINISH WHERE DUCT WILL BE PAINTED.

1.4. CONCEALED DUCT: ROUND OR RECTANGULAR AS SHOWN ON DRAWINGS.

1.8. DIFFUSER NECK SIZE IS SAME AS HARD DUCT SIZE, UNLESS NOTED OTHERWISE.

1.5. DUCT TAPE NOT PERMITTED AS SEALANT. 1.6. FIBERGLASS DUCT SYSTEMS NOT PERMITTED.

1.7. DUCT DIMENSIONS ARE INSIDE CLEAR.

1.9. UNLESS OTHERWISE NOTED, ALL CHANGES IN DIRECTION SHALL BE MADE WITH RADIUS ELBOWS WITH RADIUS TO CENTERLINE EQUAL TO 1.5 DUCT 1.10. WHERE REQUIRED FOR SPACE CONSTRAINTS, PROVIDE SQUARE THROAT ELBOWS WITH SINGLE WIDTH TURNING VANES WITH TRAILING EDGE.

1.11. FOR DUCT WIDTHS OF 36" OR LESS, PROVIDE MANUFACTURED SINGLE WIDTH TURNING VANES, WITH SPACING IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS FOR "STANDARD SPACING". USE DOUBLE THICKNESS BLADES FOR DUCT WIDTHS GREATER THAN 36" AND INCREASE DUCT SIZE TO MAINTAIN FREE AREA. USE NO TRAILING EDGES.

2.1. JOHNS-MANVILLE PERMACOTE LINACOUSTIC, NCR OF 0.70 OR HIGHER BASED ON "TYPE A MOUNTING" AND TESTED IN ACCORDANCE WITH ASTM C423. EPA REGISTERED ANTI-MICROBIAL ACRYLIC COATED AGENT, FACTORY APPLIED TO RESIST MICROBIAL GROWTH AS DETERMINED BY ASTM G21 AND G22.

#### DUCTWORK ACCESSORIES

VOLUME DAMPERS SHALL COMPLY WITH SMACNA. DAMPER EACH BRANCH RUNOUT DUCT AND WHERE REQUIRED FOR ADEQUATE BALANCING. WHERE VOLUME DAMPERS ARE NOT READILY ACCESSIBLE, PROVIDE REMOTE OPERATOR.

MISCELLANEOUS DUCTWORK ACCESSORIES. 2.1. DUCT ACCESS DOORS 2.1.1. PROVIDE HINGED DUCT ACCESS DOORS WITH GASKETS, AND WITH INSULATION WHERE DUCTWORK IS INDICATED TO BE INSULATED.

2.1.2. CESCO MODEL HAD-HINGED OR APPROVED EQUAL.

# DUCT INSULATION

 MATERIALS: 1.1. FLEXIBLE FACED FIBERGLASS DUCTWORK INSULATION: JOHNS-MANVILLE MICROLITE, WITH FSK FACTORY APPLIED FOIL\_SCRIM\_KRAFT FACING. 1.2. RIGID FIBERGLASS DUCTWORK INSULATION: JOHNS MANVILLE 800 SERIES, SPIN-GLAS TYPE 814, 3 LB. DENSITY RIGID BOARD WITH FSK JACKET.

1,2,1, FLEXIBLE PLAIN FIBERGLASS DUCTWORK INSULATION; JOHNS MANVILLE MICROLITE 1,0 LB/CU, FT, UNFACED 1.3. DUCTWORK INSULATION ACCESSORIES: PROVIDE STAPLES, BANDS, WIRES, TAPE, ANCHORS, CORNER ANGLES, AND SIMILAR ACCESSORIES AS RECOMMENDED BY THE INSULATION MANUFACTURER FOR THE APPLICATIONS INDICATED.

APPLICATION: 2.1. CONCEALED UNLINED SUPPLY DUCTWORK: 1-1/2" THICK FLEXIBLE FACED FIBERGLASS.

2.2. EXPOSED UNLINED SUPPLY DUCTWORK IN CONDITIONED SPACE: NONE.

2.3. CONCEALED UNLINED RETURN AIR DUCTWORK: 1-1/2" FLEXIBLE FIBERGLASS, WITH OR WITHOUT FACING. 2.4. EXHAUST AIR DUCTWORK WITHIN 30 FEET OF OPENING TO EXTERIOR: 1-1/2" THICK FLEXIBLE FACED FIBERGLASS.

# AIR INLETS AND OUTLETS

MANUFACTURERS

1.1. PRICE, TITUS, KRUEGER, ACUTHERM THERMAFUSER.

PRODUCTS

2.1. REFER TO DRAWINGS AND SCHEDULE FOR TYPE AND ACCESSORIES. 2.2. SUBMIT CATALOG DATA.

2.3. FOR MANUFACTURERS OTHER THAN NAME SCHEDULED, SUBMIT ALSO EACH OUTLET SHOWING NC, THROW AND PRESSURE DROP ALONG WITH ITEMIZED COMPARISON TO SPECIFIED OUTLET.

2.4. PROVIDE PRODUCTS TESTED IN ACCORDANCE WITH AIR DIFFUSION COUNCIL TEST CODES AND BEARING THE ADC SEAL. SUBMIT SUPPORTING DATA THAT SHOWS OUTLETS WERE TESTED IN ADC CERTIFIED LAB. 2.5. PROVIDE ALUMINUM IN ALL LOCKER/TOILET/SHOWER AND ADJACENT AREAS.

APPLICATION 3.1. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATIONS.

3.2. EXPOSED MOUNTING SCREWS: 3.2.1. USE TAMPER PROOF SCREWS IN COUNTERSUNK HOLES.

3.2.2. PAINT SCREWS TO MATCH FRAME.

3.3. CEILING AIR OUTLETS 3.3.1. ALIGN IN CEILING WITH TILES OR ARCHITECTURAL FEATURES AND LOCATE SYMMETRICALLY.

3.3.2. PROVIDE MINIMUM ONE DIAMETER STRAIGHT DUCT INLET AND FULL RADIUS BEND ON FLEXIBLE DUCT CONNECTION. WHERE CEILING SPACE IS INADEQUATE, PROVIDE INSULATED PLENUM WITH HEIGHT EQUAL TO TWO NECK DIAMETERS AND SIDE INLET TAP NEAR TOP OF PLENUM. 3.3.3. PROVIDE FRAMED OPENING IN HARD-LID CEILINGS SO CEILING AIR OUTLET MOUNTS ON THE FRAME AND IS REMOVABLE SIMILAR TO AN

OUTLET IN A LAY-IN CEILING SYSTEM. 3.3.4. RELOCATE DIFFUSERS WITHIN A 2 FOOT RADIUS WHERE CEILING PATTERN IS AT VARIANCE WITH OUTLET LOCATIONS SHOWN.

3.4. SIDEWALL AIR OUTLETS 3.4.1. MOUNT AT HEIGHT AS SHOWN OR AS DIRECTED BY ARCHITECT.

3.4.2. ARRANGE SO LOCATIONS ARE SYMMETRICAL TO AND CONGRUENT WITH ARCHITECTURAL FEATURES. 3.5. BALANCING

3.5.1. DO NOT USE OPPOSED BLADE DAMPERS AT AIR OUTLETS FOR BALANCING. PROVIDE ALL BRANCH DUCTS WITH VOLUME DAMPERS. ONLY WHERE IT IS NOT POSSIBLE TO INSTALL DUCT DAMPERS PROVIDE OPPOSED BLADE KEY-OPERATED DAMPERS DIRECTLY BEHIND THE AIR OUTLET. FURNISH TWO KEYS FOR EACH TYPE OF OPERATOR.

BUILDING MANAGEMENT AND AUTOMATIC TEMPERATURE CONTROL SYSTEMS

MANUFACTURERS

1.1. MATCH EXISTING

2.1. LABEL ALL DEVICES.

2.2. ALL DEVICES AND INSTALLATION SHALL BE WARRANTED TO BE FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR FROM DATE OF JOB ACCEPTANCE BY THE OWNER. ANY EQUIPMENT, SOFTWARE, OR LABOR FOUND TO BE DEFECTIVE DURING THIS PERIOD SHALL BE REPAIRED OR REPLACED WITHOUT EXPENSE TO THE OWNER. FACTORY AUTHORIZED WARRANTY SERVICE SHALL BE AVAILABLE WITHIN 75 MILES OF JOBSITE.

3. SEQUENCE OF OPERATIONS 3.1. COMMISSION EXISTING TO VERIFY PROPER OPERATION.

3.2. MAINTAIN SAME CONTROL SEQUENCE AS EXISTING IF OWNER SATISFIED WITH EXISTING.

### TEST-ADJUST-BALANCE

TEST- ADJUST- BALANCE OF ALL AIR SYSTEMS SHALL BE BY A NEBB, AABC OR TABB CERTIFIED INDEPENDENT CONTRACTOR HIRED BY GENERAL

CONTRACTOR. PROCEDURE IN ACCORDANCE WITH ASSOCIATED AIR BALANCE COUNCIL (AABC), NEBB OR TABB. PRE-BALANCE EXISTING SYSTEMS AFFECTED BY WORK PRIOR TO STARTING WORK TO DOCUMENT EXITING FLOWS. SUBMIT REPORT

NOTIFY THE CONTRACTOR OF CONDITIONS DETRIMENTAL TO THE PROPER COMPLETION OF THE TEST-ADJUST-BALANCE WORK PRIOR TO THE START OF BALANCING. DO NOT PROCEED WITH WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

ADJUST AIRFLOWS TO WITHIN -5% TO +5% OF SCHEDULED VALUES AND OUTSIDE AIR AT THE UNIT 0% TO +5%. SUBMIT COMPLETE BALANCE REPORTS TO THE ARCHITECT AND TO THE BUILDING DEPARTMENT.

SUBMIT APPROVED BALANCE REPORT TO INSPECTOR AT TIME OF FINAL INSPECTION. PATCH HOLES IN INSULATION AND DUCTWORK THAT HAVE BEEN DRILLED OR CUT FOR TEST PURPOSES IN A MANNER RECOMMENDED BY THE ORIGINAL INSTALLER.

COLORADO SPRINGS, CO 80903 TELEPHONE: (719) 667-1972

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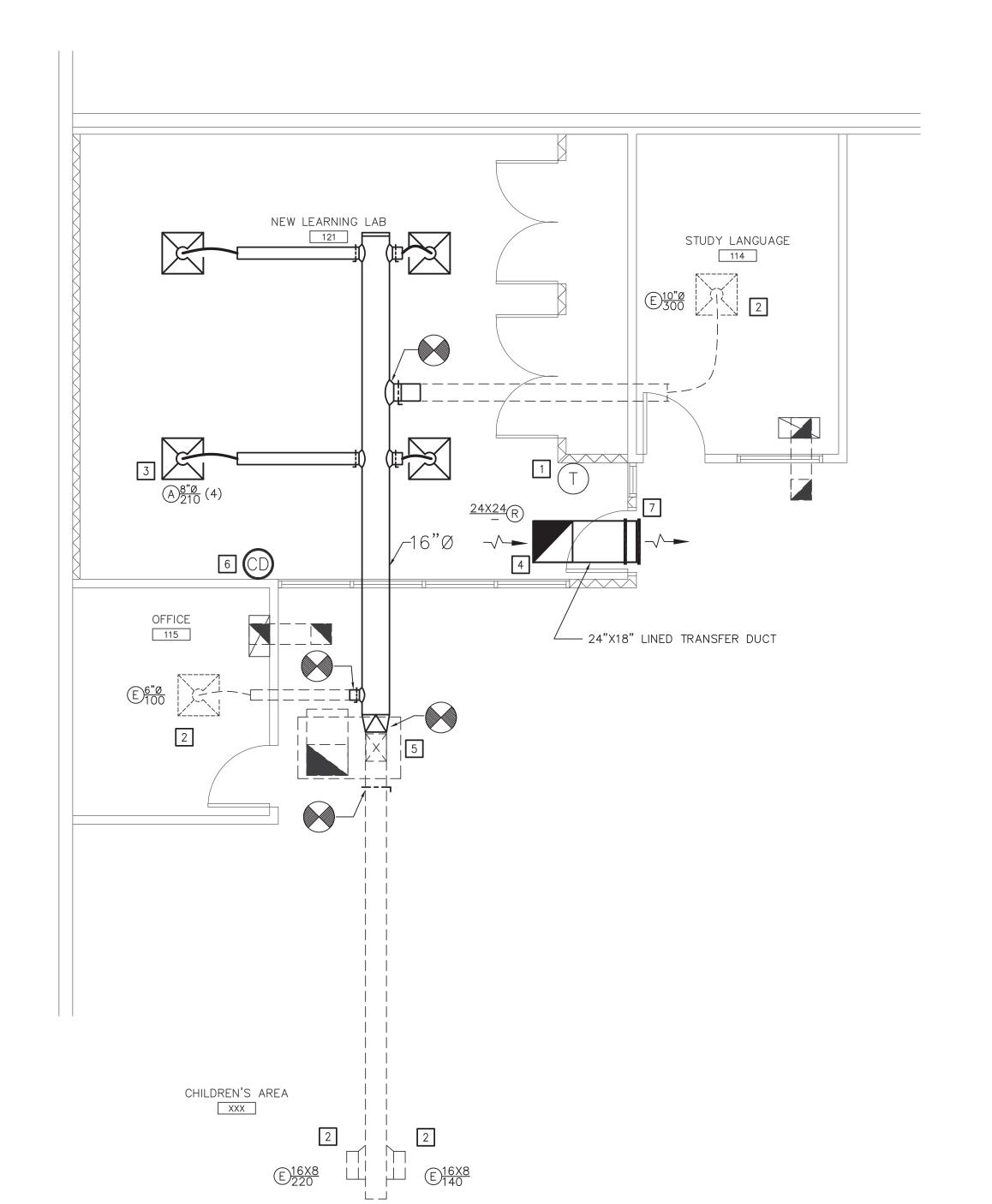
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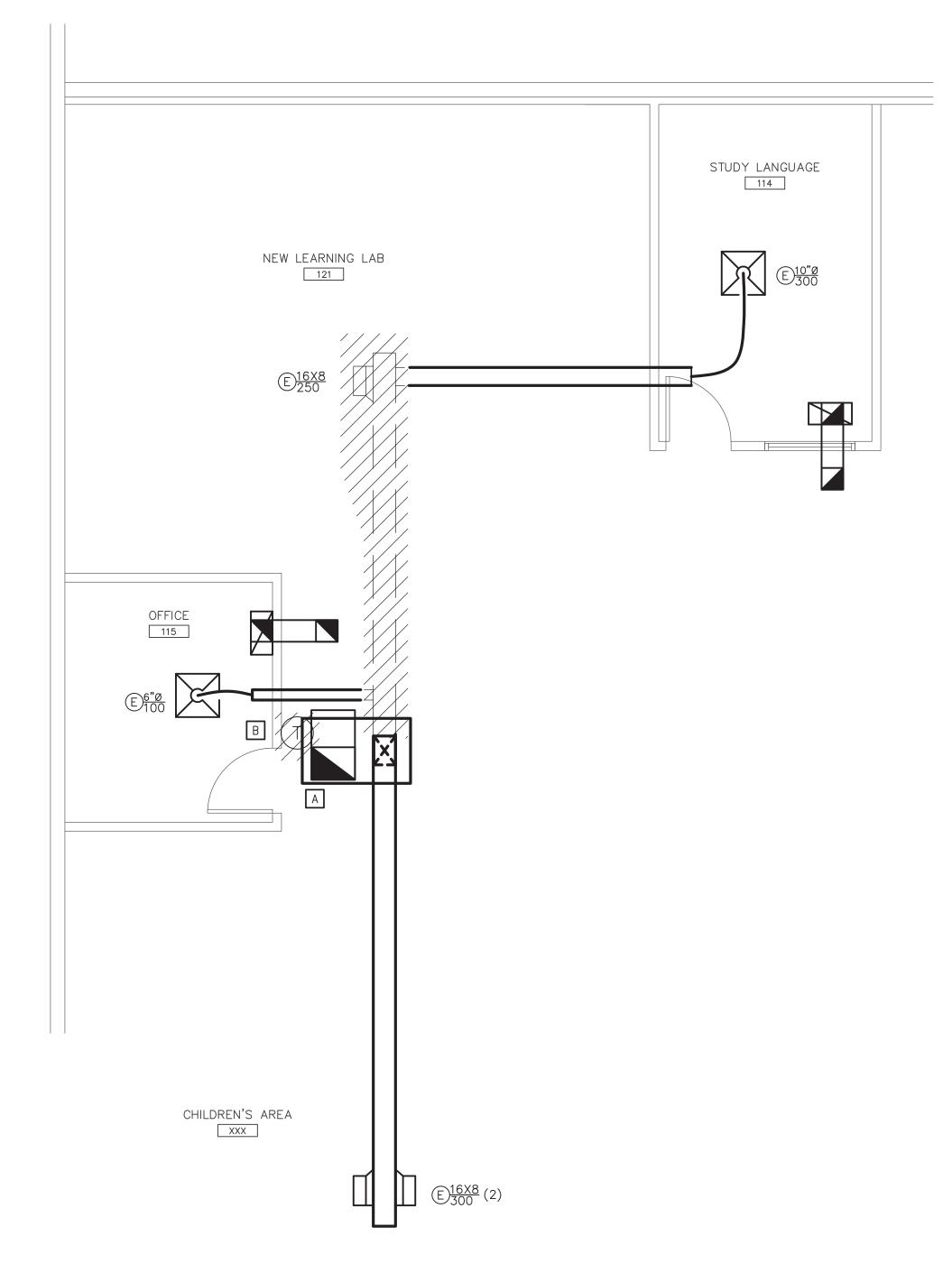


ISSUE / REVISION	
DATE:	DESCRIPTION:

MECHANICAL SPECIFICATIONS

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3. Zp = REQUIRED OA/MIN SUPPLY CFM

4. SYSTEM VENTILATION EFFICIENCY IS CALCULATED USING ASHRAE 62 APPENDIX A.





NORTH

1. Summary								
Ventilation Sizing Method					2.1-2013			
Design Condition					neating)			
Total Zone Occupancy				36				
Occupant Diversity				1				
Design Ventilation Airflow Rate				615	CFM			
2. Space Ventilation Analysis Table								
		Floor	Required	Time	Required	Air	Required	Uncorrected
	Supply Air	Area	Outdoor Air	Averaged	Outdoor Air	Distribution	Outdoor Air	Outdoor Air
Zone Name / Space Name	(CFM)	(ft²)	(CFM/ft²)	Occupancy	(CFM/person)	Effectiveness	(CFM)	(CFM)
RTU-6 (EXISTING)	1600							
New Learning Lab 121	840	522	0.12	22.00	10.00	0.80	353	283
Study Language 114	300	153	0.12	6.00	10.00	0.80	98	78
Office 115	100	106	0.06	1.00	5.00	0.80	14	11
Stacks 120	360	706	0.12	7.00	5.00	0.80	150	120
Fotals (incl. Space Multipliers)	1,600	1,487		36			615.1	492.08

GENERAL NOTES

- FIELD VERIFY EXACT LOCATION AND CONDITION OF ALL EXISTING EQUIPMENT, DUCTWORK, AND GRD'S PRIOR TO BEGINNING
- DIFFUSER DUCT CONNECTIONS ARE SCHEDULED NECK SIZE UNLESS NOTED OTHERWISE. CLEAN ALL GRD'S BEING
- REUSED. TAKE AIR BALANCE READINGS OF ALL EXISTING GRD'S PRIOR TO BEGINNING WORK ON THE AFFECTED RTU. SUBMIT. REPORT. REBALANCE TO INDICATED CFM
- UPON COMPLETION OF WORK. ADD DUCT VOLUME DAMPERS WHERE NEEDED. PROVIDE BALANCE REPORT TO MECHANICAL INSPECTOR AT TIME
- ALL MATERIALS IN RETURN AIR PLENUM SHALL HAVE A MAXIMUM RATING OF 25 FLAME/50 SMOKE. MOUNT THERMOSTAT +48"AFF

OF FINAL INSPECTION.

- TO THE TOP. RECALIBRATE THERMOSTAT. COORDINATE LOCATION OF THERMOSTATS WITH LIGHT SWITCHES. ARRANGE IN
- ORDERLY FASHION. CONTRACTOR SHALL NOTIFY ARCHITECT, IN RFI FORM, OF ANY DISCREPANCIES OR QUESTIONS PRIOR TO PROCEEDING WITH WORK.

# DEMO KEYED NOTES:

- A DUCTS UP TO EXISTING RTU-6 AND EXISTING MECHANICAL EQUIPMENT TO REMAIN. SERVICE AND REPLACE FILTERS.
- B REMOVE EXISTING THERMOSTAT AND PREP FOR RELOCATION, NEW LOCATION ON NEW WORK

## NEW KEYED NOTES

- 1 RELOCATED THERMOSTAT. RECALIBRATE.
- 2 BALANCE EXISTING AIR DEVICES AS INDICATED.
- 3 PROVIDE (N) LOUVER FACE SUPPLY DIFFUSER, PRICE SCD OR EQUAL. NECK SIZE AS INDICATED.
- 4 PROVIDE (N) TRANSFER GRILLE,
  PRICE PDDR OR EQUAL, 24"X24"
  PERFORATED, NECK SIZE AS INDICATED. 5 (E) RTU-6, ON ROOF. - 1600 CFM SA, 620 CFM OA, CARRIER MODEL 48TFF005-A-511.
- 6 ADD W7220 JADE CONTROLLER
  TO INTERFACE WITH ECONOMIZER TO MAINTAIN 800 PPM CO2.
  MODIFY ECONOMIZER CONTROLS
  TO ACCEPT SENSOR SIGNAL.
- 7 NEW PRICE 530 TRANSFER GRILLE, 24"X18", ON END OF 1" ACOUSTICALLY LINED TRANSFER BOOT.

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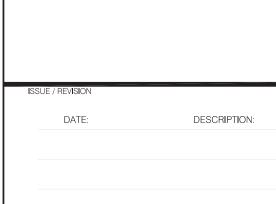
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MECHANICAL FLOOR PLANS





# **ABBREVIATIONS**

A,AMP ABOVE COUNTER OR ALTERNATING CURRENT AMERICANS WITH DISABILITIES ACT ADA AMPERE FUSE/FRAME AFF ABOVE FINISHED FLOOR ABOVE FINISHED GRADE AMPERE INTERRUPTING CAPACITY ALUMINUM ALTERNATE ANN ANNUNCIATOR ANSI AMERICAN NATIONAL STANDARDS INSTITUTE AMPERE SWITCH AMPERE TRIP ATS AUTOMATIC TRANSFER SWITCH AUTOMATIC **AUXILIARY** AMERICAN WIRE GAUGE BARE COPPER BELOW FINISHED CEILING BFG BELOW FINISHED GRADE BKR BREAKER BLDG BUILDING CONDUIT COMMUNITY ANTENNA TV (CABLE TV) CABINET CAMERA CIRCUIT BREAKER CB CBM CERTIFIED BALLAST MANUFACTURERS CCTV LOSED CIRCUIT TELEVISION CONTRACTOR FURNISHED, CONTRACTOR INSTALLED COMPACT FLUORESCENT LAMP CKT CIRCUIT CLG CEILING CO CONDUIT ONLY COAX OAXIAL COMB COMBINATION COND CONDUCTOR CONTRACTOR OR CONTINUATION CONT CURRENT TRANSFORMER COPPER CU dΒ DECIBEL DB DIRECT BURIAL DIRECT CURRENT DEMAR DEMARCATION DISC ISCONNECT DIST ISTRIBUTION DAMP LABEL DIGITAL VIDEO RECORDER DWG DRAWING EXISTING TO REMAIN ELECTRICAL CONTRACTOR OR EMPTY CONDUIT EQUIPMENT GROUNDING CONDUCTOR ELECTRICALLY HELD ELECTRIC OR ELECTRICAL ELEVATOR ELEV **EMERGENCY** ELECTRIC METALLIC TUBING EOL FIRE ALARM END OF LINE RESISTOR EMERGENCY POWER OFF EPO EQUIPMENT EQUIP EXISTING TO BE RELOCATED ELECTRIC WATER COOLER FIRE ALARM FIRE ALARM CONTROL PANEL FIRE ALARM ANNUNCIATOR PANEL FBO FURNISHED BY OTHERS FOOTCANDLES EEDER FULL LOAD AMPERES FLA FLEX FLEXIBLE CONDUIT FLOOR FLR FLUOR FLUORESCENT FIBER OPTIC FIRE ALARM TERMINAL CABINET FUSE OR FUSED G,GND GROUND SUAGE GALV GALVANIZED GENERAL CONTRACTOR GENERATOR GROUND FAULT CIRCUIT INTERRUPTER GFI,GFC GALVANIZED RIGID CONDUIT HC HORIZONTAL CROSS CONNECT HD HEAVY DUTY HAND HOLE НН HID HIGH INTENSITY DISCHARGE HAND-OFF-AUTOMATIC HORSEPOWER HPF HIGH POWER FACTOR HPS HIGH PRESSURE SODIUM HERTZ (CYCLES/SECOND) INTERCOM OR INTERMEDIATE CROSS-CONNECT INSIDE DIAMETER IDF INTERMEDIATE DISTRIBUTION FRAME ISOLATED GROUND INTERMEDIATE GRADE METALLIC CONDUIT INCANDESCENT INCAND J-BOX JUNCTION BOX THOUSAND OF CIRCULAR MILLS KCMIL KILOVOLT ΚV KILOVOLT-AMPERE KVA  $\mathsf{KW}$ KILOWATT KILOWATT-HOUR KWH LOCAL AREA NETWORK LAN LONG CONTINUOUS LOAD LCL LED LIGHT EMITTING DIODE LFC LIQUIDTIGHT FLEXIBLE CONDUIT

LML

LPF

LARGEST MOTOR LOAD

LOW POWER FACTOR

LIGHTING

LOW VOLTAGE

## **ABBREVIATIONS**

MAG	MAGNETIC
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR OR MAIN CROSS
мсв	CONNECT MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP MDF	MOTOR CIRCUIT PROTECTOR MAIN DISTRIBUTION FRAME
MDP	MAIN DISTRIBUTION PANEL
MECH MFR	MECHANICAL MANUFACTURER
MG	MOTOR GENERATOR
MH	MANHOLE OR METAL HALIDE
MIN MLO	MINIMUM MAIN LUGS ONLY
MMFO	MULTIMODE FIBER OPTIC
MPOE MSB	MAIN POINT OF ENTRY MAIN SWITCHBOARD
мтв	MAIN TERMINAL BOARD
MTD MTG	MOUNTED MOUNTING HEIGHT
MTR	MOTOR
MV N	MEDIUM VOLTAGE NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE NATIONAL ELECTRICAL MANUFACTURERS
NEMA	ASSOCIATION
NF	NON-FUSED
NFPA NIC	NATIONAL FIRE PROTECTION ASSOCIATION NOT IN CONTRACT
NL	NIGHT LIGHT
NO NTS	NORMALLY OPEN NOT TO SCALE
OC	ON CENTER
OD OFCI	OUTSIDE DIAMETER OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
OSHA	OCCUPATIONAL SAFETY AND HEALTH
OSP	ADMINISTRATION OUTSIDE PLANT
Р	POLE PUBLIC ADDRESS
PA PB	PUSH BUTTON OR PULL BOX
PBX	PRIVATE BRANCH EXCHANGE
PE PF	PHOTOELECTRIC POWER FACTOR
PH	PHASE
PNL PR	PANEL PAIRS
PRI	PRIMARY
PROX PT	PROXIMITY POTENTIAL TRANSFORMER
PTZ	PAN, TILT, ZOOM CAMERA
PVC PWR	POLYVINYL CHLORIDE POWER
QR	QUARTZ RESTRIKE
R	EXISTING TO BE REMOVED RELOCATED EXISTING
RE REC	RECEPTACLE
REQ'D	REQUIRED
RGS RM	RIGID GALVANIZED STEEL ROOM
RMC	RIGID METALLIC CONDUIT
RNC RPM	RIGID NON—METALLIC CONDUIT REVOLUTIONS PER MINUTE
SCA	SHORT-CIRCUIT AMPERES
SCCR SCP	SHORT—CIRCUIT CURRENT RATING SECURITY CONTROL PANEL
SEC	SECONDARY OR SECOND
SECT SHT	SECTION SHEET
SMFO	SINGLE-MODE FIBER OPTIC
SP SPD	SERVICE PROVIDER SURGE PROTECTION DEVICE
SPDT	SINGLE POLE, DOUBLE THROW
SPST ST	SINGLE POLE, SINGLE THROW SHUNT TRIP
STP	SHIELDED TWISTED PAIR
STD SYS	STANDARD SYSTEM
SW	SWITCH
SWBD TBB	SWITCHBOARD TELECOMMUNICATIONS BONDING BACKBONE
TC	TIME CLOCK
TEL TELCO	TELEPHONE TELEPHONE COMPANY
TELCOM	TELECOMMUNICATIONS
TEMP TGB	TEMPORARY OR TEMPERATURE TELECOMMUNICATIONS GROUND BUS
TMGB	MAIN TELECOMMUNICATIONS GROUND BUS
TO	THERMAL OVERLOAD TAMPER RESISTANT OR TELECOMMUNICATIONS
TR	ROOM
TS	TIME SWITCH
TTB TTC	TELEPHONE TERMINAL BOARD TELEPHONE TERMINAL CABINET OR CLOSET
TV	TELEVISION
TYP UC	TYPICAL UNDER COUNTER
UG	UNDER GROUND
UL UON	UNDERWRITER LABORATORIES UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
UTP V	UNSHIELDED TWISTED PAIR VOLT
VA	VOLT-AMPERE
VAR VFD	REACTIVE VOLT—AMPERES VARIABLE FREQUENCY DRIVE
VP	VAPOR PROOF
W .	WATT

WITH

WCR

XFMR

WITHOUT

WATT HOUR

WATERTIGHT

TRANSFORMER

WATT HOUR METER WEATHERPROOF

EXPLOSION PROOF

WITHSTAND CURRENT RATING

WEATHERPROOF LOCKABLE ENCLOSURE

# ONE-LINE SYMBOLS

SYMBOL	DESCRIPTION
- -	PROVISION FOR UTILITY METER GROUND
	FEEDER IDENTIFIER SYMBOL  NON-FUSED DISCONNECT SWITCH  FUSED DISCONNECT SWITCH W/ AMP FUSE AND AMP FRAME  CIRCUIT BREAKER DISCONNECT

# POWER DEVICES

SYMBOL				DESCRIPTION		
STUB	CLG	FLOOR	WALL			
<b>-</b>		Ø	φ	DUPLEX RECEPTACLE		
<b>—</b>	<b>※</b>	<b>#</b>	#	FOURPLEX RECEPTACLE		
	$\bigcirc$		$\bigcirc$	TELEVISION OUTLET		
<b>○</b>	<b>\$</b>	<b>(</b> )	Ф	JUNCTION BOX		
	:	<b>\$</b> ™		SINGLE POLE THERMAL OVERLOAD SWITCH		
ď			NON-FUSED DISCONNECT SWITCH			
				FUSED DISCONNECT SWITCH		
				PANEL BOARD		
6				LIGHTING CONTROL PANEL / CONTROL PANEL		
				PAD MOUNTED TRANSFORMER		

# ANNOTATION LEGEND

SYMBOL	DESCRIPTION
1	KEYED NOTE TAG
XXXX	EQUIPMENT NAME TAG
# SHT.	DETAIL TAG
- #	MECHANICAL EQUIPMENT TAG
AA-1,3,5	IDENTIFIES SINGLE OR MULTIWIRE BRANCH CIRCUITS (THREE CIRCUITS SHOWN) IN HOMERUN TO PANEL AA.

# RACEWAY LEGEND

SYMBOL	DESCRIPTION
	BRANCH CIRCUIT HOMERUN TO PANELBOARD NUMBER OF ARROWS INDICATE NUMBER OF PANEL LEGS. NUMERAL INDICATES CIRCUIT BREAKER NUMBER.
	CONCEALED CONDUIT IN WALL OR CEILING
С	CONDUIT CAP
	CONDUIT CONTINUATION

# GENERAL ELECTRICAL REQUIREMENTS

- . THE DISCONNECTING MEANS FOR ALL MECHANICAL EQUIPMENT SHALL BE ACCESSIBLE AND HAVE THE CLEARANCE IN FRONT AS REQUIRED BY NEC AMENDMENTS.
- 2. ALL CEILING ATTACHED OBJECTS SHALL BE INSTALLED IN ACCORDANCE WITH SUPPORTING OBJECTS FOR SEISMIC ZONE AS REQUIRED BY STATE AND LOCAL CODES AND PER STRUCTURAL ENGINEERS RECOMMENDATIONS.
- 3. DATA GIVEN ON THE DRAWINGS IS AS EXACT AS COULD BE SECURED.
  ABSOLUTE ACCURACY IS NOT GUARANTEED AND THE CONTRACTOR SHALL
  OBTAIN AND VERIFY EXACT LOCATIONS, MEASUREMENTS, LEVELS, SPACE
  REQUIREMENTS, POTENTIAL CONFLICTS WITH OTHER TRADES, ETC. AT THE
  SITE AND SHALL SATISFACTORILY ADAPT HIS WORK TO ACTUAL CONDITIONS
  AT THE BUILDINGS. THE DRAWINGS ARE DIAGRAMMATICAL IN NATURE AND
  SHALL NOT BE SCALED. HOWEVER THIS DOES NOT RELIEVE ANY
  SUB—CONTRACTOR FROM COORDINATING WORK WITH ALL OTHER TRADES
  AND FROM ADJUSTING WORK AS REQUIRED BY THE ACTUAL CONDITIONS OF
  THE PROJECT. THE CONTRACTOR SHALL VISIT THE SITE BEFORE
  SUBMITTING COSTS TO BECOME THOROUGHLY FAMILIAR WITH THE ACTUAL
  CONDITIONS OF THE PROJECT.
- COORDINATE AND ADJUST ALL WORK BETWEEN TRADES AND EXISTING CONDITIONS IN ORDER TO ACCOMPLISH A NEAT, INTEGRATED AND EFFICIENT INSTALLATION WHICH INCLUDE BUT ARE NOT LIMITED TO:
  - a. EXAMINE THE CONTRACT DOCUMENTS OF ALL TRADES (IE. THE ARCHITECTURAL REFLECTED CEILING PLAN, MECHANICAL HVAC DRAWINGS, ELECTRICAL LIGHTING PLAN, FIRE PROTECTION PLAN, FTC.)
- b. COORDINATE NECESSARY EQUIPMENT, FIXTURES, ETC. SO THAT THE FINAL INSTALLATION IS COMPATIBLE WITH THE MATERIALS AND EQUIPMENT OF THE OTHER TRADES.
- c. THE ELECTRICAL DRAWINGS INDICATE THE ELECTRICAL REQUIREMENTS FOR A SIGNIFICANT PORTION OF THE MECHANICAL AND PLUMBING SYSTEMS. ADDITIONAL MECHANICAL AND PLUMBING EQUIPMENT IS INDICATED ON THE MECHANICAL AND PLUMBING DRAWINGS. REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION. PROVIDE COMPLETE WIRING AND FUSIBLE DISCONNECTING MEANS FOR ALL MECHANICAL AND PLUMBING EQUIPMENT UNLESS OTHERWISE NOTED.

## 7. DEFINITIONS:

- a. "FURNISH" MEANS TO "SUPPLY" AND USUALLY REFERS TO AN ITEM OF EQUIPMENT.
- b. "INSTALL" MEANS TO "SET IN PLACE, CONNECT AND PLACE IN FULL OPERATIONAL ORDER".
- c. "PROVIDE" MEANS TO "FURNISH AND INSTALL".
- d. "EQUIVALENT" MEANS "MEETS THE SPECIFICATIONS OF THE REFERENCE PRODUCT OR ITEM IN ALL SIGNIFICANT ASPECTS." SIGNIFICANT ASPECTS SHALL BE DETERMINED BY THE ENGINEER.
- e. "WORK BY OTHER(S) (CONTRACTOR): "RE:\_\_\_\_\_\_\_DIVISION",
  AND SIMILAR EXPRESSIONS MEANS WORK TO BE PERFORMED UNDER
  THE CONTRACT DOCUMENTS, BUT NOT NECESSARILY UNDER THE
  DIVISION OR SECTION OF THE WORK ON WHICH THE NOTE APPEARS.
  IT IS THE CONTRACTORS SOLE RESPONSIBILITY TO COORDINATE THE
  WORK OF THE CONTRACT BETWEEN HIS/HER SUPPLIERS,
  SUBCONTRACTORS, AND EMPLOYEES. IF CLARIFICATION IS
  REQUIRED, CONSULT ARCHITECT BEFORE START OF WORK.
- 8. ALL ELECTRICAL CONDUIT CROSSING BUILDING SEISMIC SEPARATION OR EXPANSION JOINTS SHALL BE PROVIDE WITH APPROVED FLEXIBLE CONNECTORS. REFER TO THE ARCHITECTURAL PLANS FOR ALL EXPANSION JOINT LOCATIONS.
- 9. WHERE DISCONNECTS ARE INDICATED ON DRAWINGS CONTRACTOR SHALL PROVIDE FINAL CONNECTION TO EQUIPMENT BEING SERVED BY DISCONNECT.

# **GENERAL NOTES FOR REMODEL**

- 1. THE INFORMATION ON THE DEMOLITION DRAWINGS REGARDING EXISTING CONDITIONS WAS OBTAINED LARGELY FROM FIELD OBSERVATIONS AND DISCUSSIONS WITH FACILITY PERSONNEL. PROVIDE A SURVEY OF THE EXISTING BUILDING, AND VERIFICATION OF THE EXISTING CONDITIONS.
- 2. REFER TO THE ARCHITECTURAL DEMOLITION FLOOR PLANS AND REFLECTED CEILING PLANS, TO ESTABLISH THE COMPLETE SCOPE OF WORK.
- 3. PROVIDE THE REQUIRED NEW CONDUIT, CONDUIT INTERCEPTIONS, JUNCTION BOXES, PULL BOXES, NEW CONDUCTORS, ETC. TO ACCOMPLISH THE WORK, INTEGRATE THE NEW WORK WITH THE EXISTING WHERE INDICATED. MAINTAIN THE CONTINUITY AND OPERATION OF THE EXISTING SYSTEMS IN THE AREAS ADJACENT TO THE REMODELED AREAS.
- EXISTING BRANCH CIRCUIT CONDUITS MAY BE REUSED FOR THE NEW WORK. UNDER THESE CONDITIONS, PROVIDE ALL NEW CONDUCTORS. CONDUCTOR FILL PER CODE. IN CEILING SPACES, REMOVE ANY EXISTING CONDUITS THAT ARE NOT REUSED.
- 5. WHERE THE ARCHITECTURAL DRAWINGS INDICATE THAT AN EXISTING PARTITION IS TO BE REMOVED, DISCONNECT AND REMOVE EXISTING ELECTRICAL AND SIGNAL DEVICES, OUTLET BOXES, CONDUIT AND CONDUCTORS. REMOVE CONDUCTORS BACK TO THE LAST ELECTRICAL OR SIGNAL DEVICE TO REMAIN ACTIVE. REFER TO THE DEMO AND MODERNIZATION DRAWINGS FOR THE SCOPE OF THIS WORK.
- 6. ALL REMOVED LIGHTING FIXTURES, RECEPTACLE OUTLETS, SECURITY, PUBLIC ADDRESS AND FIRE ALARM DEVICES SHALL BE RETURNED TO THE OWNER AS DIRECTED.
- 7. CLEAN AND RE-LAMP ALL RELOCATED LIGHTING FIXTURES TO MATCH THE COLOR SPECIFIED DURING CONSTRUCTION.
- 8. WHERE THE ELECTRICAL DRAWINGS INDICATE THAT A DEVICE, OF ANY TYPE, IS TO BE REMOVED FROM A PARTITION THAT REMAINS, DISCONNECT AND REMOVE THE DEVICE AND OUTLET BOX. REMOVE THE CONDUCTORS BACK TO THE LAST DEVICE TO REMAIN ACTIVE. CAP THE CONDUIT IN THE PARTITION AND ABANDON. AT THE TOP OF THE PARTITION, INTERCEPT AND CAP THE CONDUIT IN THE CEILING SPACE AT THE FIRST ACCESSIBLE COUPLING.
- . WHERE THE DRAWINGS INDICATE THAT AN EXISTING CONDUIT (BRANCH CIRCUIT OR FEEDER) IS TO BE INTERCEPTED, FOR PURPOSES OF EXTENDING TO A NEW LOCATION, ALWAYS REMOVE THE EXISTING CONDUCTORS AND PROVIDE NEW CONDUCTORS BETWEEN POINTS OF CONNECTION. WHEN THIS WORK REQUIRES REMOVING AN EXISTING WIRING DEVICE (RECEPTACLE OR SWITCH) AT A LOCATION THAT REMAINS, PROVIDE A NEW WIRING DEVICE AND PLATE.
- 10. VERIFY ALL EXISTING FIXTURES TO BE REUSED ARE FUNCTIONAL PRIOR TO BIDDING. PROVIDE NEW LAMPS AT ALL REUSED FIXTURES.

# LIGHTING

	Lidiffilia
SYMBOL	DESCRIPTION
	2'x4' FLUORESCENT FIXTURE (RECESSED)
$\longmapsto$	STRIP LIGHT
<b>\$</b> ab	SINGLE POLE TOGGLE SWITCH (LOWER CASE LETTERS DENOTES MULTIPLE SWITCHES)
<b>⊗</b>	CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR
	SHADED SYMBOLS DENOTE EMERGENCY FIXTURES

TYPICAL 9'-0" CEILING OR HIGHER PAPED TOP OF CABINET FAAP TOP OF CABINET FAAP TOP OF CEILING TOP OF CABINET FAAP TOP OF SIKOBE OR WHICHEVER IS TOWER IS TOWER IS TOWER TOP OF DEVICE WITHOUT OR SIKOBE OR WHICHEVER IS TOWER T

- NOTES:

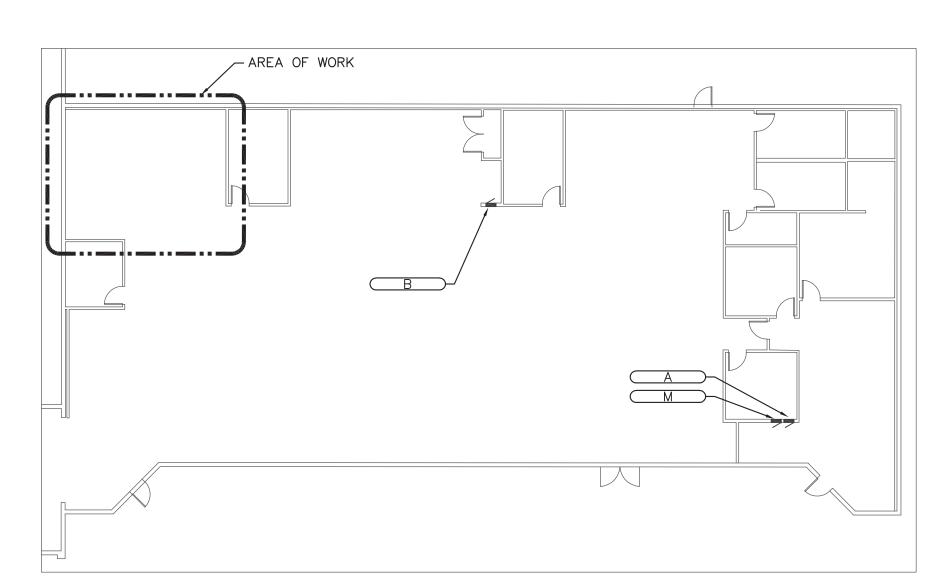
  1. HEIGHTS SHOWN ARE TYPICAL TO CENTERLINE OF BOX
- UNLESS OTHERWISE NOTED.

  2. MOUNTING HEIGHTS SHOWN ON ARCHITECTURAL ELEVATIONS SHALL GOVERN OVER THOSE SHOWN
- 3. CONTRACTOR SHALL ENSURE THAT MOUNTING HEIGHTS COMPLY WITH CURRENT ADA REQUIREMENTS.
  4. WHEREVER DEVICES ARE INDICATED TO BE ABOVE
- DOOR TRIM AND CEILING LINE.

  5. ALL ABOVE COUNTER (DESIGNATED BY "AC") DEVICES

DOORS, DEVICE SHALL BE CENTERED BETWEEN TOP OF

NOTE: ALL DEVICES INDICATED
TO BE INSTALLED AT DIFFERENT
MOUNTING HEIGHTS AND LOCATED
WITHIN ONE STUD SPACE FROM
EACH OTHER SHALL ALIGN
VERTICALLY, ON THE SAME SIDE
OF THE STUD. WHERE WALL
MOUNTED TELEPHONES OCCUR OVER
LIGHT SWITCHES, VOLUME CONTROLS,
ETC. OFFSET ONE STUD SPACE.



OVERALL KEYPLAN
SCALE: NTS

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DATE: 02/07/2020
PROJECT MGR: ELE

PREPARED BY:



ISS	SUE / REVISION	
	DATE:	DESCRIPTION:

SHEET TITLE

ELECTRICAL LEGEND

SHEET NUMBER

FO 1

#### PART 1 — GENERAL

- 1.01 CONFORM TO ALL APPLICABLE STATE, COUNTY AND MUNICIPAL CODES AND ORDINANCES AND NEMA, UL, ANSI AND CBM STANDARDS. WHERE A PROVISION OF PERTINENT CODES AND STANDARDS CONFLICT WITH THIS SPECIFICATION, THE MORE STRINGENT PROVISIONS SHALL GOVERN.
- 1.02 APPLY AND PAY FOR ALL PERMITS AND/OR INSPECTIONS REQUIRED BY LEGAL AUTHORITIES. 1.03 COORDINATE ELECTRICAL WORK, AND EXISTING SYSTEM SHUTDOWNS WITH THE OWNER. NOTIFY THE OWNER OF PLANNED SHUTDOWNS A MINIMUM OF TWO (2) DAYS PRIOR TO COMMENCEMENT OF THE WORK, INCLUDING INFORMATION OF TYPE OF SERVICE, PLANNED
- 1.04 PRIOR TO SUBMITTING BID, SURVEY THE AREA WHERE THE NEW WORK WILL BE DONE FOR ANY EXISTING CONDITIONS WHICH MAY AFFECT OR BE AFFECTED BY THE WORK UNDER THIS SECTION. EXAMINE THE DRAWINGS AND SPECIFICATIONS OF ALL TRADES TO ESTABLISH THE SCOPE OF WORK TO BE PROVIDED UNDER THIS SECTION. LIST ANY EXCEPTIONS TO THE CONTRACT DOCUMENTS AND SUBMIT WITH BID.
- 1.05 EXERCISE EXTREME CARE TO INSURE PROTECTION OF EXISTING ELECTRICAL EQUIPMENT AND PREMISES FROM DAMAGE. ASSUME COMPLETE RESPONSIBILITY FOR ANY AND ALL DAMAGE RESULTING FROM THIS WORK.
- 1.06 EXERCISE CARE TO PREVENT THE GENERATION OF UNNECESSARY NOISE DURING THE WORK, AND KEEP NOISE LEVELS TO THE MINIMUM POSSIBLE.
- 1.07 PROVIDE BID BASED ON SPECIFIED MATERIAL AND EQUIPMENT. SUBSTITUTIONS OF SPECIFIED
- 1.08 PROVIDE SHOP DRAWINGS AND MANUFACTURER'S DATA, FOR RECEPTACLES, OUTLETS, CONDUCTORS AND CONDUITS.

MATERIALS AND EQUIPMENT ARE SUBJECT TO THE APPROVAL OF THE ENGINEER.

- A. PROVIDE PROTECTION FOR MOVING PARTS AND HAZARDOUS CONDITIONS.
- B. PROVIDE INDUSTRIAL ACCIDENT AND WARNING SIGNS PER ANSI AND OSHA.
- ERECT AND MAINTAIN SUITABLE BARRIERS, PROTECTIVE DEVICES, LIGHTS AND WARNING SIGNS FOR THE PROTECTION OF THE PUBLIC AND EMPLOYEES FROM THE WORK UNDER THIS
- D. CONFORM WITH APPLICABLE SAFETY REGULATIONS, INCLUDING THOSE OF THE ENGINEER AND
- 1.10 MANUFACTURER'S NAMES, PRODUCTS AND NUMBERS LISTED ON THE DRAWINGS OR IN THESE SPECIFICATIONS. ALONG WITH SPECIFIC DESCRIPTIONS IN THESE SPECIFICATIONS. SET THE STANDARD OF QUALITY AND PERFORMANCE. SELECT PRODUCTS OF ONE OF THE LISTED MANUFACTURERS MEETING THESE STANDARDS AND MODIFY STANDARD CATALOG ITEMS WHERE REQUIRED TO MEET SPECIFICATIONS. THE PHRASE "OR EQUAL BY" FOLLOWED BY MANUFACTURER'S NAMES MEANS, THAT THIS MANUFACTURER'S PRODUCT SHALL MATCH THE PERFORMANCE, CONSTRUCTION, FIT AND FEATURES SPECIFIED.
- 1.11 AT THE CONCLUSION OF THE WORK, PROVIDE A SET OF RECORD REPRODUCIBLE ELECTRICAL CONTRACT DRAWINGS, SIGNED AND DATED, INDICATING THE ACTUAL INSTALLATION OF THE ELECTRICAL WORK INCLUDING ALL REVISIONS, BULLETINS AND CHANGE ORDERS.
- 1.12 GUARANTEE ALL WORK FOR A PERIOD OF ONE YEAR FROM THE DATE OF WRITTEN ACCEPTANCE OF THE WORK BY THE OWNER.

#### PART 2 - PRODUCTS

#### 2.01 GENERAL

- PROVIDE MATERIAL AND EQUIPMENT OF NEW AND RECENT MANUFACTURE, CURRENTLY UL LABELED AND/OR LISTED FOR THE SPECIFIED USE.
- WHERE UL LABELING IS NOT AVAILABLE, PROVIDE CERTIFICATION BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL).
- C. FOR EACH CATEGORY OF MATERIAL AND EQUIPMENT, USE PRODUCTS OF THE SAME MANUFACTURE AND TYPE.

#### 2.02 CONDUCTORS - 600V

#### A. GENERAL:

- PROVIDE CONDUCTORS SUITABLE FOR THE TEMPERATURE. CONDITIONS, AND LOCATION WHERE INSTALLED. ALL CONDUCTORS SHALL BE NEW AND DELIVERED TO THE SITE IN ORIGINAL UNBROKEN PACKAGES OR REFLS. MANUFACTURED WITHIN FIGHT (8) MONTHS OF INSTALLATION, OF SOFT DRAWN COPPER OF NOT LESS THAN 98 PERCENT CONDUCTIVITY, 75 DEGREE CELSIUS TEMPERATURE RATING, CONFORMING WITH ASTM SPECIFICATION AND NEC; 600V INSULATION UNLESS SPECIFICALLY NOTED OTHERWISE, OF THE TYPE SPECIFIED STANDARD AMERICAN WIRE GAUGE (AWG) SIZES; SOLID FOR NO. 10 AWG AND SMALLER; STRANDED FOR NO. 8 AWG AND LARGER.
- 2. ALL PACKAGES, PLAINLY MARKED OR TAGGED WITH UNDERWRITERS' LABELS; SIZE, TYPE NSULATION AND VOLTAGE RATING OF THE WIRE; NAME OF MANUFACTURING COMPANY AND THE TRADE NAME OF THE WIRE; DATE OF MANUFACTURE.
- B. CONDUCTOR MATERIAL: ALL CONDUCTORS SHALL BE COPPER, SINGLE CONDUCTOR RATED AT 600 VOLTS, WHICH CONFORM OR EXCEED ICEA SPECIFICATIONS AND THE FOLLOWING CONDUCTOR INSULATION
- NO. 2 AWG AND SMALLER: THWN, XHHW-2. FOR DRY LOCATIONS: THWN.
- MC (METAL CLAD) CABLE: USE ONLY FROM OVERHEAD JUNCTION BOXES DOWN THE WALL FLECTRICAL OUTLETS DO NOT USE FOR HOMERUNS RUNS TO LIGHT SWITCHES CONNECTING DEVICES FROM ADJACENT OR OPPOSITE WALLS, AND CONNECTING DEVICES IN SEPARATE ROOMS. A CONDUIT AND JUNCTION BOX "BACKBONE" SYSTEM SHALL BE INSTALLED THROUGHOUT THE BUILDING. MC CABLE IS TO ONLY BE UTILIZED DOWN THE WALL FROM THE OVERHEAD JUNCTION BOX LOCATED IN THE ROOM IT'S SERVICING, MC CABLE ALSO SERVING OUTLETS IN ADJACENT ROOMS IS NOT ACCEPTABLE LE BACK TO BACK OUTLETS PROPER FACTORY APPLIED CONDUCTOR COLOR-CODING SHALL BE FOLLOWED. TAPING OF

CONDUCTORS IS NOT ACCEPTABLE. MC CABLE SHALL COMPLY WITH THE FOLLOWING

#### REQUIREMENTS AND STANDARDS:

- UL 83, 1479, 1569, AND NEC 230 AND 300. GALVANIZED STEEL ARMOR.
- 2, 3, AND 4 CONDUCTORS, #12 AND #10 THHN SOLID COPPER. MYLAR TAPE COVERING FOR CONDUCTOR ASSEMBLY.
- 90°C MAXIMUM TEMPERATURE RATING, DRY LOCATIONS
- INSULATED GREEN GROUNDING CONDUCTOR. MAXIMUM 600V RATING
- WHERE INDICATED ON THE DRAWINGS, PROVIDE #10 NEUTRAL CONDUCTOR COMBINED WITH THE #12 PHASE CONDUCTORS IN THE CABLE ASSEMBLY.

# 2.03 RACEWAYS

- A. RIGID STEEL CONDUIT: ANSI C80.1: RIGID CONDUIT INCLUDING COUPLINGS, LOCKNUTS, NIPPLES: STEEL, HOT-DIPPED GALVANIZED INSIDE AND OUT AFTER THREADING, GALVANIZED, THREADED MALLEABLE IRON OR STEEL FITTINGS, NOTCHED LOCKNUTS WITH GRIPPING TEETH. DELIVER WITH PLASTIC THREAD PROTECTORS ON EXPOSED CONDUIT THREADS.
- INTERMEDIATE STEEL CONDUIT: UL 1242: INTERMEDIATE METAL CONDUIT INCLUDING COUPLINGS, LOCKNUTS, NIPPLES: STEEL, HOT PROCESS GALVANIZED OUTSIDE, LACQUERED OR ENAMELED INSIDE, GALVANIZED THREADS, GALVANIZED THREADED MALLEABLE IRON OR STEEL FITTINGS, NOTCHED LOCKNUTS WITH GRIPPING TEETH. DELIVER WITH PLASTIC THREAD PROTECTORS ON EXPOSED CONDUIT THREADS.
- C. ELECTRICAL METALLIC TUBING AND FITTINGS: ANSI C80.3: ELECTRIC METALLIC TUBING (EMT) INCLUDING LOCKNUTS, COUPLINGS AND CONNECTORS: GALVANIZED STEEL, LACQUERED OR ENAMELED INTERIOR; RAINTIGHT GLAND RING COMPRESSION TYPE FITTINGS AND SETSCREW FITTINGS, INSULATED THROAT CONNECTORS.
- FLEXIBLE METAL CONDUIT: UL 1, ZINC-COATED STEEL: FLEXIBLE CONDUIT: MANUFACTURED FROM SINGLE STEEL STRIP, GALVANIZED ON ALL FOUR SIDES PRIOR TO FABRICATION, DIE CAST TWIST—IN CONNECTORS, UL LISTED FOR GROUND CONTINUITY. ALUMINUM OR REDUCED WALL FLEXIBLE CONDUIT IS NOT ACCEPTABLE.

# 2.04 OUTLET AND JUNCTION BOXES AND FITTINGS.

- PROVIDE BRIGHT AND NEW STOCK, STORED WHERE CONTINUOUSLY PROTECTED FROM WEATHER AND CONFORMING TO THE FOLLOWING:
- OUTLET BOXES AND COVERS: STEEL, KNOCKOUT TYPE, WITH FULL ACCESS SCREW-ON COVERS OR PLASTER RINGS, HOT-DIPPED, GALVANIZED, WITH CADMIUM PLATED OR GALVANIZED MACHINE SCREWS.
- 2. JUNCTION OR PULL BOXES:
- CODE GAUGE SHEET STEEL CONSTRUCTION, RUST RESISTANT ZINC COATING, WITH FULL ACCESS SCREWED ON COVERS AND CADMIUM PLATED OR GAI VANIZED MACHINE SCREWS, MINIMUM SIZE PER THE GOVERNING ELECTRICAL CODE OR AS NOTED ON THE DRAWINGS, WHICHEVER IS GREATER; BARRIERS FOR REQUIRED SEPARATION; SPECIAL CONFIGURATION, WHERE DETERMINED FROM FIELD MEASUREMENTS TO SURMOUNT STRUCTURAL CONDITIONS. FOR FLUSH MOUNTING EXTEND COVERS 3/4" BEYOND EDGE OF BOXES. WHERE USED FOR CABLE SUPPORT, BRACE BOX TO SUPPORT CABLE WEIGHT, FOR JUNCTION BOXES LARGER THAN 36" IN ANY DIMENSION. PROVIDE 3/4" DIAMETER STEEL PIPE CABLE SUPPORTS WITH FLANGED ENDS WITH CONTINUOUS FIBER INSULATING SLEEVE AND BOLTED TO BOX FRAME, SPACED ON 36" CENTERS MAXIMUM. FOR COVER DIMENSIONS 3'x4' OR LARGER, PROVIDE TWO PIECE COVERS EQUIPPED WITH HANDLES.

b. FACTORY FINISH: WASH AND PHOSPHATE UNDERCOAT. ANSI 49 GRAY ENAMEL PAINT FOR NEMA 1, ANSI 61 GRAY POLYESTER POWDER FINISH FOR NEMA 3R AND 12. KNOCKOUT CLOSURES AND LOCKNUTS; PROVIDE CORROSION-RESISTANT BOX KNOCKOUT CLOSURES, CONDUIT LOCKNUTS, OFFSET CONNECTORS, OF TYPES AND SIZES, TO SUIT RESPECTIVE INSTALLATION REQUIREMENTS AND APPLICATIONS.

#### 2.05 WIRING DEVICES

## A. GENERAL:

DRAWINGS

- SPECIFICATION GRADE DEVICES.
- GENERAL USE: GRAY COLOR (AS AVAILABLE) UNLESS OTHERWISE NOTED OR
- 3. SCREW TYPE TERMINALS ON DEVICES, SUITABLE FOR UP TO NO. 10 SOLID COPPER CONDUCTORS. 4. WHERE NOT SPECIFIED HEREIN, PROVIDE CONFIGURATION AS INDICATED ON
- B. RECEPTACLES: SHALL COMPLY WITH UL 498 AND NEMA WD1 AND WD5.
- GENERAL: NUMBER OF POLES AND AMPERE RATING AS SHOWN ON DRAWINGS AND OF NEMA STANDARD CONFIGURATIONS. GROUND POLE CONNECTED TO CIRCUIT GROUNDING CONDUCTOR
- DUPLEX CONVENIENCE RECEPTACLES: 20A, 125V; GROUNDING THIRD POLE; SIDE-WIRED FOR 2 WIRE CIRCUIT USE. WHERE 2 CIRCUITS ARE INDICATED, PROVIDE INDIVIDUAL CIRCUIT FOR EACH HALF. NEMA 5-20R.
- FLUSH TUMBLER, AC TYPE, INSULATED BASE, COMPLETELY ENCLOSED.
- 20A, TUNGSTEN LOAD RATED, AT 277V. 1 POLE, 2 POLE, 3-WAY, 4-WAY OR KEY OPERATED AS INDICATED ON DRAWINGS. 2 POLE UNIT USEABLE FOR (2) 120V CIRCUITS OR (1) 277V CIRCUIT ONLY. DO NOT USE FOR TWO 277V CIRCUITS.
- D. WALL PLATES: SINGLE AND COMBINATION, OF TYPES, SIZES, AND WITH GANGING AND CUTOUTS AS INDICATED. PROVIDE METAL SCREWS FOR SECURING PLATES TO DEVICES WITH SCREW HEADS COLORED TO MATCH FINISH OF PLATES. PROVIDE WALL PLATES WITH LEGEND AS SPECIFIED, OR WHERE INDICATED ON DRAWINGS. ALL LETTERING SHALL BE BLACK FOR NORMAL POWER SYSTEMS. PROVIDE PLATES POSSESSING THE FOLLOWING ADDITIONAL CONSTRUCTION FEATURES:
- 1. DEVICE PLATES OF ONE MAKE AND DESIGN FOR ALL OUTLETS, SMOOTH, SATIN FINISH, TYPE 302, STAINLESS STEEL, 0.035" THICK, BEVELED EDGES, TO FIT

#### 2.08 LIGHTING FIXTURES, GENERAL

- A. PROVIDE A COMPLETE LIGHTING SYSTEM, WIRED, ASSEMBLED AND OPERABLE, INCLUDING LIGHTING EQUIPMENT AND ACCESSORIES AS SHOWN ON THE DRAWINGS, DESCRIBED IN THE FIXTURE SCHEDULE, SPECIFIED HEREIN AND COVERED BY ALLOWANCE, ACCESSORIES INCLUDE CANOPIES, SUSPENSION OF PROPER LENGTHS. HICKEYS, CASTINGS, SOCKETS, HOLDERS, REFLECTORS, BALLASTS, DIFFUSING MATERIAL, LOUVERS, PLASTER AND MOUNTING FRAMES, LAMPS, RECESSING BOXES, SUPPORTING BRACKETS AND CHANNELS, WHERE REQUIRED TO SPAN STRUCTURAL MEMBERS.
- FOR RECESSED FIXTURES, PROVIDE FRAME AND TRIM COMPATIBLE WITH CEILING TYPE AND CONSTRUCTION. REFER TO CEILING SPECIFICATIONS AND ARCHITECTURAL DRAWINGS TO DETERMINE TYPES.
- D. PROVIDE ADEQUATE LAMP SHIELDING, PROPER VENTILATION AND HEAT DISSIPATION
- SECURE DIFFUSERS TO TRIM BY DEVICES NOT REQUIRING TOOLS FOR REMOVAL, OR FOR RELAMPING. PROVIDE SAFETY CHAIN ATTACHMENT TO FIXTURE HOUSING FOR PORTIONS OF FIXTURES WHICH ARE REMOVED FOR SERVICING OR RELAMPING.

#### A. GENERAL: UNLESS SPECIFIED OTHERWISE HEREIN, FURNISH AND INSTALL LAMPS FOR EACH FIXTURE OF TYPE AND WATTAGE INDICATED ON DRAWINGS OR OTHER

# PART 3 - EXECUTION

SECTION OF THE SPECIFICATION.

### 3.01 SITE CONDITIONS

- A. EXAMINE THE DRAWINGS OF ALL TRADES, AND SPECIFICATION SECTIONS, SURVEY THE EXISTING CONDITIONS, AND INCLUDE NECESSARY ALLOWANCES IN BID
- B. RESOLVE ALL CONFLICTS WITH CODE REQUIREMENTS, SITE CONDITIONS AND THE WORK OF OTHER TRADES.
- VERIFY THE LOCATIONS OF EXISTING UTILITIES PRIOR TO CONSTRUCTION AND PROTECT THEM FROM DAMAGE.
- D. PAY COSTS INCURRED DUE TO DAMAGE OF EXISTING UTILITIES OR OTHER FACILITIES.

# 3.02 LOCATIONS

- A. DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC, AND ALTHOUGH THE SIZE AND LOCATIONS OF EQUIPMENT ARE GENERALLY SHOWN TO SCALE. MAKE USE OF DATA IN CONTRACT DOCUMENTS, AND INFORMATIONAL DOCUMENTS, INCLUDING SHOP DRAWINGS. AND VERIFY THIS INFORMATION AGAINST FIELD CONDITIONS.
- B. DRAWINGS INDICATE THE REQUIRED SIZE AND POINTS OF TERMINATION OF CONDUITS, AND THE NUMBER AND SIZE OF WIRES AND SUGGEST PROPER ROUTING OF CONDUIT. INSTALL CONDUIT WITH ALL NECESSARY OFFSETS, JUNCTION BOXES, AND FITTINGS TO CONFORM TO THE STRUCTURE, AVOID OBSTRUCTIONS, PRESERVE HEADROOM, MAINTAIN REQUIRED ACCESSIBILITY, AND SATISFY THE REQUIREMENTS OF THE GOVERNING CODES AND THE STANDARDS OF GOOD PRACTICE.
- C. WHEN CHANGES IN INDICATED LOCATIONS OR ARRANGEMENTS ARE NECESSARY DUE TO CONDITIONS IN BUILDING CONSTRUCTION, REARRANGEMENT OF FURNISHINGS OR EQUIPMENT, OR CONFLICT IN LOCATION, MAKE SUCH CHANGES AT NO COST TO OWNER, PROVIDED THAT THE CHANGE IS ORDERED BEFORE CONDUIT IS INSTALLED AND THAT LENGTH OF CONDUIT RUN IS NOT REVISED BY MORE THAN TEN FEET.
- D. BRING DISCREPANCIES BETWEEN DIFFERENT DRAWINGS, BETWEEN DRAWINGS AND ACTUAL FIELD CONDITIONS, OR BETWEEN DRAWINGS AND SPECIFICATIONS, PROMPTLY TO THE ATTENTION OF THE ARCHITECT OR ENGINEER FOR DECISION. AND STOP PERTINENT WORK SUBJECT TO RESOLUTION OF THE CONFLICT.
- COORDINATE THE LOCATION OF THE LIGHTING FIXTURES AND FRAMING WITH THE CEILING CONSTRUCTION SO THAT THE OVERALL PATTERN IS ACCEPTABLE TO THE ARCHITECT. ARCHITECTURAL REFLECTED CEILING DRAWINGS, PLANS AND DETAILS
- F. PROVIDE CLARIFYING DETAILS WHERE REQUIRED BY INSPECTING AUTHORITY AND OBTAIN ARCHITECT'S AND INSPECTOR'S APPROVAL PRIOR TO INSTALLATION.

- A. PROVIDE COMPLETE FUNCTIONING SYSTEMS AND INCLUDE LABOR, MATERIAL AND ASSOCIATED TOOLS AND TRANSPORTATION REQUIRED FOR THE SYSTEM TO OPERATE SAFELY AND SATISFACTORILY. PROVIDE EMPTY CONDUIT SYSTEMS WHERE SPECIFIED, COMPLETE, CLEAR, AND WITH PULL WIRES, READY TO ACCEPT CONDUCTORS AND ALLOW FOR EQUIPMENT INSTALLATION.
- B. PROVIDE WORK INDICATED ON THE DRAWINGS WHETHER OR NOT SPECIFICALLY MENTIONED IN THE SPECIFICATIONS.
- COORDINATE THE INSTALLATION OF ELECTRICAL ITEMS WITH THE SCHEDULES FOR WORK OF OTHER TRADES TO PREVENT DELAYS IN TOTAL WORK. ASSUME RESPONSIBILITY FOR COOPERATIVE WORK, WHICH MUST BE ALTERED DUE TO LACK OF PROPER SUPERVISION OR FAILURE TO MAKE PROPER PROVISION IN TIME. PERFORM ALTERATIONS TO ARCHITECT'S SATISFACTION, AND PAY COSTS.
- D. RESOLVE CODE CONFLICTS PRIOR TO INSTALLATION. REMOVE AND REPLACE WORK CONFLICTING WITH CODES OR, IN THE ARCHITECT'S OPINION, NOT MEETING SPECIFIED REQUIREMENTS AND PAY COSTS.

# 3.04 QUALITY ASSURANCE

- PROVIDE AN EXPERIENCED SUPERINTENDENT IN CHARGE OF ERECTION OF THE WORK, TOGETHER WITH ALL NECESSARY JOURNEYMEN, HELPERS AND LABORERS REQUIRED TO PROPERLY UNLOAD, ERECT, CONNECT, ADJUST, OPERATE AND TEST THE WORK INVOLVED TO PRODUCE A NEAT, WORKMANLIKE INSTALLATION. LATEST INDUSTRY STANDARDS ARE CONSIDERED MINIMUM.
- B. FOR THE ACTUAL FABRICATION, INSTALLATION, AND TESTING OF THE WORK OF THIS SECTION USE ONLY THOROUGHLY TRAINED AND EXPERIENCED PERSONNEL WHO ARE COMPLETELY FAMILIAR WITH THE REQUIREMENTS FOR THIS WORK AND WITH THE INSTALLATION RECOMMENDATIONS OF THE MANUFACTURERS OF THE SPECIFIED ITEMS. WHERE SPECIFIED, PROVIDE FACTORY PERSONNEL FOR TESTING AND ADJUSTING, SUBMIT QUALITY ASSURANCE PROGRAM AND DETAILED TESTING PROCEDURES FOR REVIEW.

#### 3.05 EXISTING FACILITIES

- EXAMINE THE DRAWINGS AND SPECIFICATIONS OF THE COMPLETE WORK, AND INSPECT THE SITE TO ESTABLISH THE SCOPE OF DEMOLITION WORK AND NEW WORK TO BE PROVIDED UNDER THIS SECTION AND CLARIFICATION OF THE PHASING
- BASED ON PROJECT PHASING AND SCHEDULING, DEMOLITION WORK WILL BE TAKING PLACE IN AND AROUND EXISTING AREAS THAT ARE TO REMAIN IN SERVICE. WHERE THE WORK UNDER THIS SECTION AFFECTS OR INTERFERES WITH THE OPERATION OF EXISTING AREAS TO REMAIN IN SERVICE, OR PORTIONS OF THE WORK ALREADY IN OPERATION, PROVIDE NECESSARY WORK AND MATERIAL INCLUDING PREMIUM PAY, REQUIRED TO AVOID SHUTDOWN OF THESE AREAS DURING NORMAL OPERATIONS. OBTAIN OWNER'S APPROVAL FOR SHUTDOWN, IN WRITING, 48 HOURS PRIOR TO SHUTDOWN.
- C. EXISTING ELECTRICAL AND SIGNAL FACILITIES OUTSIDE OF THE DEMOLITION AREA TO REMAIN IN PLACE AND IN SERVICE DURING DEMOLITION.
- D. UNLESS SPECIFICALLY NOTED OR OTHERWISE INDICATED OR DIRECTED, REMOVE EXISTING ELECTRICAL EQUIPMENT IN THE AREAS TO BE DEMOLISHED. DELIVER EQUIPMENT REMOVED, INCLUDING LIGHTING FIXTURES, TO THE OWNER'S REPRESENTATIVE.

#### 3.06 REMODELING

- A. WHERE REMODELING OF EXISTING AREAS IS INDICATED, PROVIDE WORK INDICATED AND REQUIRED FOR A COMPLETE AND OPERATING FACILITY, WHERE WORK IS ADJACENT TO EXISTING FIXTURES OR DEVICES, PROVIDE MATCHING PRODUCTS TO PRESENT UNIFORM APPEARANCE. SALVAGE DEMOLISHED MATERIAL AND EQUIPMENT AND DELIVER TO OWNER AS DIRECTED. DISPOSE OF SALVAGED MATERIAL AND EQUIPMENT WHERE SO DIRECTED IN WRITING BY OWNER. PATCH OPENINGS IN EXISTING WALLS OR FLOORS CAUSED BY REMOVAL OF MATERIAL AND/OR EQUIPMENT UNDER THIS WORK.
- B. VERIFY ALL EXISTING FIXTURES TO BE REUSED ARE FUNCTIONAL PRIOR TO BIDDING. PROVIDE NEW LAMPS AT ALL REUSED FIXTURES.

WHERE AREAS OF EXISTING FACILITIES ARE INDICATED TO BE DEMOLISHED OR REMODELED, VISIT SITE TO DETERMINE SCOPE OF WORK. RELOCATE ELECTRIC AND SIGNAL SYSTEM EQUIPMENT, AND REROUTE OR REPLACE CONDUIT AND WIRING TO CONFORM WITH NEW USE OF THE AREA AND MAINTAIN OPERATION OF ADJACENT

#### 3.09 TESTS AND CERTIFICATION

- A. GENERAL: PROVIDE TESTING IN ACCORDANCE WITH NETA REQUIREMENTS, AS SPECIFIED UNDER INDIVIDUAL EQUIPMENT AND SYSTEM SPECIFICATIONS AND AS
- UPON COMPLETION OF THE WORK, AND AS A CONDITION FOR ACCEPTANCE, TEST ALL COMPONENTS AND SYSTEMS IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE TO DEMONSTRATE COMPLIANCE WITH THE SPECIFICATIONS. PROVIDE TESTS AS SPECIFIED AND AS REQUIRED BY THE CODE OR ENFORCING AUTHORITIES. ADJUST, REPAIR AND/OR REPLACE DEFECTIVE MATERIAL AND EQUIPMENT
- TIGHTEN ALL BOLTED CONNECTIONS AND MEGGAR ALL EQUIPMENT AND BUS PRIOR
- TABULATE ALL TEST DATA AND PREPARE CERTIFIED TYPEWRITTEN REPORT COVERING ALL TESTING PERFORMED AND INCLUDE IN OPERATING AND MAINTENANCE INSTRUCTION MANUAL(S).

## 3.10 INSTALLATION OF CONDUCTORS

- STORE CONDUCTORS WHERE CONTINUOUSLY PROTECTED FROM SUNLIGHT, HEAT
- B. CIRCUIT AS INDICATED ON PLANS AND SINGLE LINE DIAGRAMS.
- C. DO NOT INSTALL MORE CONDUCTORS IN A RACEWAY THAN INDICATED ON THE
- D. MINIMUM WIRE SIZE SHALL BE NO. 12 AWG, EXCEPT FOR CONTROL OR SIGNAL CIRCUITS WHICH MAY BE NO. 14 AWG.
- E. ALL WIRING FOR BRANCH CIRCUITS SHALL BE MINIMUM NO. 12 AWG, PROTECTED BY 20 AMPERE CIRCUIT BREAKERS. IF DISTANCE FROM PANEL TO FIRST OUTLET IS 75' OR GREATER FOR 120 VOLT CIRCUITS, AND 125' OR GREATER FOR 277 VOLT CIRCUITS, NO. 10 AWG SHALL BE INSTALLED THROUGHOUT THE CIRCUIT, UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- F. PROVIDE CONDUCTORS IN PARALLEL FEEDER RUNS OF IDENTICAL LENGTHS.
- ACCEPTABLE PULLING MEANS INCLUDE: FISH TAPE WITH BALL TYPE HEADS, CABLE ROPE, AND BASKET WEAVE WIRE/CABLE GRIPS WHICH DO NOT DAMAGE CABLES OR RACEWAYS. DO NOT USE ROPE HITCHES FOR PULLING ATTACHMENTS TO WIRE OR CABLE.

H. USE ONLY LUBRICANT, WHICH DOES NOT DAMAGE CONDUCTORS, AS A PULLING

- AID. NO LUBRICANT IS TO BE USED ON BRANCH CIRCUIT CONDUCTORS CONNECTED TO GROUND FAULT-INTERRUPTING CIRCUIT BREAKERS. BUNDLE AND SECURE FEEDER, BRANCH CIRCUIT AND CONTROL CONDUCTORS, IN PANELBOARDS, SWITCHBOARDS, MOTOR CONTROL CENTERS, AND TERMINAL
- CABINETS WITH NYLON TIE WRAPS SUITABLE FOR CONDUCTOR SIZE. PROVIDE TIE WRAPS ON APPROXIMATELY 12" CENTERS. IDENTIFY SPARE CONDUCTORS (LINE, CONTROL AND SIGNAL). TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING
- VALUES SPECIFIED IN UL 486A AND UL 486B. INSTALL ALL CONDUCTORS IN CONDUIT. COMPLETE CONDUIT SYSTEM AND CLEAN AND DRY CONDUIT BEFORE PULLING IN CONDUCTORS. INSTALL CONDUCTORS AFTER GENERAL CONSTRUCTION WORK IN AREA HAS PROGRESSED SUFFICIENTLY TO

VALUES. WHERE MANUFACTURER'S TORQUE REQUIREMENTS ARE NOT INDICATED,

TIGHTEN CONNECTORS AND TERMINALS TO COMPLY WITH TIGHTENING TORQUE

- AVOID CONDUCTOR DAMAGE. RUN NEUTRAL CONDUCTORS CONTINUOUS TO PANEL. DO NOT COMBINE. RUN FEEDERS CONTINUOUS TO PANEL OR EQUIPMENT WITHOUT SPLICES. DO NOT SPLICE OR TAP IN EQUIPMENT ENCLOSURES OR CONDUIT BODIES. MAKE NECESSARY SPLICES ON TAPS ONLY IN JUNCTION BOXES, PULL BOXES, OR IN OVERSIZE WIRING GUTTERS DESIGNED FOR THE PURPOSE AT PANELBOARDS.
- M. ALLOW 8" MINIMUM FREE LENGTH OF CONDUCTOR WHERE TERMINATING IN OUTLET OR PULL BOX. PROVIDE LONGER LENGTHS WHERE INDICATED.
- N. DO NOT LOOP THROUGH RECEPTACLE TERMINALS: CONNECT BY MEANS OF CONDUCTOR TAPS JOINED TO BRANCH CIRCUIT CONDUCTORS.

WITH SEMI-RIGID INSULATING SHELL, OR SETSCREW TYPE, TAPED.

- 3.11 CONNECTIONS AND TERMINATIONS, LINE VOLTAGE CONDUCTORS: A. FOR BRANCH CIRCUIT CONDUCTORS NO. 8 AWG AND SMALLER, USE STEEL SPRING
- COORDINATE EQUIPMENT TERMINATIONS WITH EQUIPMENT SUPPLIER TO INSURE THAT TERMINALS PROVIDED CONFORM WITH REQUIREMENTS SPECIFIED HEREIN.
- C. SPLICE GROUNDING CONDUCTORS BY MEANS OF EXOTHERMIC WELDING AND
- TERMINATE BY MEANS OF APPROVED GROUNDING CONNECTORS. DO NOT SOLDER.
- D. POSITION SPLICES IN PULL BOXES AND JUNCTION BOXES, SO THEY ARE ACCESSIBLE FROM THE REMOVABLE COVER SIDE OF THE BOX. TORQUE ELECTRICAL CONDUCTOR TERMINATIONS IN ACCORDANCE WITH EQUIPMENT

MANUFACTURER'S DIRECTIONS AND INDUSTRY STANDARDS.

CIRCUITS.

- A. USE RIGID STEEL CONDUIT UP TO 6", OR INTERMEDIATE STEEL CONDUIT UP TO 4": IN SLAB ON GRADE; ON EXTERIOR; ENCASED IN EXTERIOR MASONRY OR CONCRETE WALLS; IN WET LOCATIONS; IN REFRIGERATED SPACES; WHERE CONDUIT IS ROUTED EXPOSED WITHIN 7 FEET OF FLOOR OR WALKING SURFACES; IN SUSPENDED SLABS. BUT ONLY WHERE PERMISSION IS OBTAINED FROM ARCHITECT
- IN WRITING FOR CONDUIT TO BE RUN IN A SUSPENDED SLAB. USE RIGID OR INTERMEDIATE STEEL CONDUIT, OR ELECTRIC METALLIC TUBING UP TO 4" FOR: DRY CONCEALED LOCATIONS; WHERE CONDUIT IS ROUTED EXPOSED ABOVE 7 FEET FROM FLOOR OR WALKING SURFACES; INCLUDING BUT NOT LIMITED
- C. USE FLEXIBLE STEEL CONDUIT, 1/2" MINIMUM, AND 3/4" MAXIMUM, TRADE SIZE, IN METAL STUD PARTITIONS AND ABOVE ACCESSIBLE LAY-IN TILE CEILINGS. DO NOT USE FLEXIBLE CONDUIT FOR HOMERUNS TO PANELBOARDS, OR FOR EMERGENCY

TO MECHANICAL ROOMS, IN ELECTRICAL AND TELEPHONE ROOMS AT ALL HEIGHTS.

TRADE SIZE.

PROVIDE BEND RADIUS FOR FLEXIBLE CONDUIT NOT LESS THAN 5 TIMES THE

E. DO NOT USE FLEXIBLE CONDUIT FOR TELECOMMUNICATIONS OR DATA CABLING UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS.

- F. WHERE PENETRATING FLOORS OR FIRE SEPARATIONS, USE UL LISTED FITTINGS AND/OR DEVICES TO MAINTAIN SEPARATION INTEGRITY.
- 3.13 INSTALLATION OF CONDUIT
- A. DELIVER RACEWAYS AND WIREWAYS TO THE SITE IN STANDARD LENGTHS, AND STORE WHERE CONTINUOUSLY PROTECTED FROM MOISTURE AND WEATHER.
- B. CONDUIT SIZES ON THE DRAWINGS ARE MINIMUM, SIZED FOR COPPER CONDUCTORS, FOR NORMAL DIMENSION INSULATION. UNLESS OTHERWISE NOTED, USE 1/2" TRADE SIZE MINIMUM. INCREASE SIZES WHERE REQUIRED BY PHYSICAL CONDITIONS, OR CONDUCTOR INSULATION. DO NOT COMBINE RUNS WITHOUT WRITTEN APPROVAL. ALLOW FOR GROUNDING CONDUCTOR.
- C. CONCEAL CONDUIT FROM VIEW ABOVE CEILINGS, BELOW FLOORS OR IN WALLS. REFER TO ARCHITECTURAL SECTIONS AND DETAILS TO DETERMINE CONDUIT ROUTING REQUIRED TO CONCEAL CONDUIT.
- D. CONDUIT MAY BE EXPOSED TO VIEW IN SHOP AND UTILITY AREAS AND WHERE INDICATED. INSTALL ALL CONDUIT RUNS PARALLEL WITH OR PERPENDICULAR TO STRUCTURAL MEMBERS. SURMOUNT OBSTRUCTIONS BY USE OF BENDS, OFFSETS, AND WHERE NECESSARY WITH JUNCTION AND PULL BOXES. FOR SURFACE MOUNTED OUTLETS AND SMALL JUNCTION BOXES WITHIN 7' OF FLOOR, USE CAST BOXES AND/OR CONDUIT BODIES.
- E. CUT CONDUITS AND RACEWAYS SQUARE AND FREE OF BURRS. REAM CONDUIT ENDS AND CLEAN CONDUITS BEFORE PULLING CONDUCTORS.
- F. CAP OPEN ENDS OF CONDUITS WITH APPROVED MANUFACTURED CONDUIT SEALS UNTIL READY TO PULL IN CONDUCTORS.

G. FOR BENDS AND OFFSETS IN CONDUIT, USE LARGE RADIUS FACTORY FITTINGS, OR

LEAST 12" BEYOND CONDUIT. PULL ROPE TENSILE STRENGTH TO BE 240 POUNDS

BEND WITH HYDRAULIC BENDER MEETING THE NEC REQUIREMENTS. REPLACE ALL FLATTENED, DEFORMED OR KINKED CONDUIT. H. PROVIDE NO. 14 AWG BLACK IRON PULL WIRE OR POLYETHYLENE OR NYLON PULL ROPE IN ALL EMPTY CONDUITS AND STUBS OVER 10' IN LENGTHS, EXTENDING AT

UP TO 1-1/2" CONDUIT AND 800 POUNDS FOR LARGER CONDUIT.

- SECURE RIGID OR IMC CONDUITS TO PANELBOARDS, PULL BOXES, WIREWAYS AND ENCLOSURES WITH LOCKNUTS, INSIDE AND OUT, AND PROVIDE IMPACT RESISTANT PLASTIC, INSULATED THROAT OR MALLEABLE IRON BUSHINGS AT TERMINATIONS IN PULL BOXES, WIREWAYS, SIGNAL CABINETS, BOXES AND ENCLOSURES. ZINC INSULATED THROAT HUBS WITH "O" RING GASKETS MAY BE USED IN LIEU OF DOUBLE LOCKNUT AND BUSHING. FOR FEEDER CONDUCTORS NO. 4 AWG AND LARGER, PROVIDE STEEL OR MALLEABLE IRON INSULATING BUSHINGS WITH PLASTIC LINER. FOR EMT, PROVIDE INSULATED THROAT CONNECTORS SECURED WITH
- FIELD THREAD RIGID AND IMC CONDUIT TO CONFORM TO AMERICAN STANDARD PIPE THREADS TAPERED FOR THE ENTIRE LENGTH AT 3/4 INCH/FOOT. TREAT THREADS WITH PROTECTIVE COATING TO PREVENT CORROSION, BUT MAINTAIN
- K. UPON COMPLETION OF INSTALLATION OF RACEWAYS, INSPECT INTERIORS OF RACEWAYS; CLEAR ALL BLOCKAGES AND REMOVE BURRS, DIRT, AND
- 3.14 INSTALLATION OUTLET BOXES AND FITTINGS

CONSTRUCTION DEBRIS.

LOCKNUT ON INTERIOR OF BOX OR ENCLOSURE.

- A. GENERAL: INSTALL ELECTRICAL BOXES AND FITTINGS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS, APPLICABLE REQUIREMENTS OF THE CODE AND NECA'S "STANDARD OF INSTALLATION," AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO FULFILL PROJECT REQUIREMENTS.
- B. COORDINATE INSTALLATION OF ELECTRICAL BOXES AND FITTINGS WITH
- CONDUCTORS, WIRING DEVICES, AND RACEWAY INSTALLATION WORK. C. INSTALL OUTLETS AND BOXES IN READILY ACCESSIBLE LOCATIONS.
- D. INSTALLING BOXES BACK-TO-BACK IN WALLS IS NOT PERMITTED. PROVIDE A MINIMUM OF 12" OF SEPARATION. AVOID USING ROUND BOXES WHERE CONDUIT MUST ENTER BOX THROUGH SIDE OF
- BOX, WHICH WOULD RESULT IN DIFFICULT AND INSECURE CONNECTIONS WHEN FASTENED WITH LOCKNUT OR BUSHING ON ROUNDED SURFACES. TAPS AND SPLICES WHERE PERMITTED BY THESE SPECIFICATIONS WITHIN EXTERIOR JUNCTION BOXES, SHALL BE PERFORMED WITH AN ENCAPSULATING WATERTIGHT SPLICE OR TAP KIT WHICH INSULATES AND MOISTURE SEALS THE CONNECTION.
- RESIN AND END SEALING TAPE. G. SUBSEQUENT TO INSTALLATION OF BOXES, PROTECT BOXES FROM CONSTRUCTION

KIT SHALL CONSIST OF THE APPROPRIATE SIZE AND TYPE MOLD, ENCAPSULATING

- DEBRIS AND DAMAGE. H. PROVIDE ADDITIONAL PULL OF JUNCTION BOXES AS REQUIRED TO MEET CODE REQUIREMENTS OR TO FACILITATE PULLING OF WIRES. LOCATE IN UTILITY AREAS,
- ABOVE ACCESSIBLE CEILINGS, ON IN APPROVED LOCATIONS. SIZE BOXES FOR DEVICES CONTAINED AND THE NUMBER OF WIRES PASSING THROUGH OR TERMINATING THEREIN, BUT NOT LESS THAN 4" SQUARE BY 1-1/2" DEEP. USE PULL AND JUNCTION BOXES OF ADEQUATE SIZE FOR SPLICES AND TERMINATIONS CONTAINED THEREIN.
- USE 4-11/16" SQUARE BOX WITH ROUND PLASTER RING, FOR SURFACE MOUNTED CEILING FIXTURES.
- COMMON PLATE. USE GANG BOXES FOR THREE OR MORE DEVICES. PROVIDE BARRIER BETWEEN 277V SWITCHES CONTROLLING TWO OR MORE CIRCUITS. L. UNLESS SPECIFIED OTHERWISE IN OTHER SECTIONS, PROVIDE A 4-11/16" SQUARE BY 2-1/8" DEEP BOX WITH ONE GANG FLUSH PLASTER RING FOR WALL MOUNTED

K. WHERE MORE THAN ONE SWITCH IS SHOWN AT ONE LOCATION. GROUP BEHIND

- TELEPHONE, DATA, COMPUTER, DICTATION, MATV OR INTERCOM OUTLETS. RECESS BOXES. EXCEPT IN UNFINISHED AREAS SUCH AS UTILITY TUNNELS. MECHANICAL, AND ELECTRICAL SPACES. PROVIDE EXTENSION RINGS AND/OR PLASTER RINGS TO FINISH FLUSH WITH FINISHED SURFACES, INCLUDING THE INSIDE FACE OF THE BACKS OF CASEWORK. INSTALL APPROVED FACTORY MADE KNOCKOUT SEALS WHERE KNOCKOUTS ARE NOT INTACT, AND CLOSE ALL
- N. SUPPORT LIGHT FIXTURE OUTLETS TO BUILDING STRUCTURE AND EQUIP WITH FIXTURE STUD AND HANGAR BAR OR SUPPORTING DEVICE AS REQUIRED. SUPPORT LIGHTING FIXTURES IN EXCESS OF 60 POUNDS TO STRUCTURE INDEPENDENTLY OF
- OUTLET BOX.
- O. PROVIDE BOXES FOR ALL DEVICES. FOR DEVICES NOT SPECIFIED OR SCHEDULED, USE BOXES AS APPROVED, ADEQUATE FOR DEVICE TO BE INSTALLED. P. COMBINE DEVICES IN GANGED BOX WITH SUITABLE BARRIERS BEHIND COMMON PLATE WHERE INDICATED, SPECIFIED, OR DETAILED. PROVIDE SEPARATE OR
- BARRIERED BOXES FOR NORMAL AND EMERGENCY DEVICES. Q. INSTALL BOXES IN A RIGID MANNER, WITH BOX HANGERS, EXPANSION SHIELDS IN MASONRY, AND MACHINE SCREWS ON METAL WORK. DO NOT NAIL TO STRUCTURE. USE PLATED OR GALVANIZED SCREWS THROUGHOUT.
- R. SECURE PULL AND JUNCTION BOXES TO THE STRUCTURE INDEPENDENTLY OF THE CONDUITS BY MEANS OF BOLTS, ROD HANGERS OR BRACKETS.
- 3.15 SUPPORT AND FASTENING OF RACEWAYS AND WIREWAYS A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY
- AND PERMANENTLY IN ACCORDANCE WITH CODE REQUIREMENTS. B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM. AND WITH OTHER
- ELECTRICAL, HVAC AND PLUMBING SYSTEMS INSTALLATIONS. C. INSTALL RIGID STEEL CONDUIT WITH THREADED COUPLINGS. SUPPORT CONDUITS 1" AND LARGER ON 10 FOOT INTERVALS, SMALLER THAN 1" ON 7 FOOT INTERVALS, ALL SIZES WITHIN 3' OF CONNECTION TO ANY ELECTRICAL ENCLOSURE, BOX,
- CABINET, OR FITTING, INCLUDING COUPLINGS. SUPPORT ELECTRIC METALLIC TUBING ON MAXIMUM SPACING OF 10' AND WITHIN 3' OF CONNECTION TO ANY ELECTRICAL ENCLOSURE, BOX, CABINET, OR FITTING,
- E. AT PLASTER OR DRYWALL PARTITIONS, ATTACH ONLY TO THE FRAMING STUDS OR TO A BACKING PLATE OR STEEL CHANNEL THAT SPANS BETWEEN STUDS.

INCLUDING COUPLINGS.

OR MOUNTED ON SHOCK MOUNTS.

- F. ATTACH TO SOLID MASONRY WALLS WITH STEEL WEDGE EXPANSION ANCHORS. G. DO NOT FASTEN RIGID CONDUIT OR TUBING TO EQUIPMENT SUBJECT TO VIBRATION
- H. WHERE ATTACHING TO STEEL MEMBERS, USE BEAM CLAMP, WELDED THREADED STUDS, OR MACHINE SCREWS. WHERE NOT OTHERWISE SPECIFIED HEREIN, SUPPORT ALL SIZES OF SUSPENDED

CONDUIT FROM BEAMS OR GIRDERS WITH FACTORY MADE PIPE HANGERS WITH

SPLIT HINGED MALLEABLE IRON OR SPRINGABLE STEEL PIPE RINGS AND SOLID

- ROUND MILD STEEL RODS, 1/4" DIAMETER FOR UP TO 1-1/4" CONDUIT, 3/8" DIAMETER UP TO 2" CONDUIT, AND 1/2" DIAMETER FOR LAGER CONDUIT. FRICTION TYPE CONDUIT SUPPORT HARDWARE AND ATTACHMENTS ARE NOT ACCEPTABLE. WHERE REQUIRED CONDUIT SUPPORT SPACING IS MORE FREQUENT THAN STRUCTURAL MEMBERS, PROVIDE INTERMEDIATE STEEL SUPPORT AS REQUIRED.
- J. PROVIDE TRAPEZE TYPE HANGERS WHERE THREE OR MORE CONDUITS RUN PARALLEL AND CLAMP CONDUIT TO HANGER WITH GALVANIZED STEEL CONDUIT CLAMPS. PROVIDE DIAGONAL SEISMIC BRACING FOR SUSPENDED RUNS OF CONDUITS 2-1/2" TRADE SIZE AND LARGER. UTILIZE U-CHANNELS FOR TRAPEZE
- K. DO NOT USE PERFORATED METAL STRAP OR WOOD AS SUPPORT MATERIAL

ASSEMBLIES. LATHING CHANNELS ARE NOT ACCEPTABLE.

- SUPPORT CONDUIT TO STRUCTURE ABOVE SUSPENDED CEILINGS 3" MINIMUM ABOVE CEILING TO ALLOW REMOVAL OF TILE. DO NOT SUPPORT FROM T-BARS OR T-BAR HANGER WIRES. MAINTAIN 2" CLEARANCE ABOVE RECESSED LIGHT
- ABOVE FIXED CEILINGS AND IN STUD WALLS, TIE CONDUIT 1" OR SMALLER TO FURRING. SUPPORT CHANNELS CAPABLE OF CARRYING THE WEIGHT. OR STUDS WITH NO. 16 GAUGE GALVANIZED WIRE TIES 4' ON CANTER, MAXIMUM.

DOCUMENTS AND FIELD CONDITIONS.

- 3.16 INSTALLATION OF LIGHTING FIXTURES A. COORDINATE EXACT QUANTITIES AND CRITICAL DIMENSIONS WITH THE CONTRACT
- B. INSTALL LIGHTING FIXTURES IN ACCORDANCE WITH FIXTURE MANUFACTURER'S WRITTEN INSTRUCTIONS, APPLICABLE REQUIREMENTS OF THE CODE, NECA'S "STANDARD OF INSTALLATION," NEMA STANDARDS, AND WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT LIGHTING FIXTURES FULFILL INSTALLATION
- C. INSTALL RECESSED FIXTURES PROPERLY TO ELIMINATE LIGHT LEAKAGE BETWEEN FIXTURE FRAME AND FINISHED SURFACE. PROVIDE PLASTER FRAMES FOR RECESSED FIXTURES INSTALLED IN OTHER THAN SUSPENDED GRID TYPE ACOUSTICAL CEILING SYSTEMS. BRACE FRAMES TEMPORARILY TO PREVENT DISTORTION DURING HANDLING.
- D. CONNECTIONS: USE UNDERWRITERS' LABORATORIES APPROVED SOLDERLESS CONNECTORS FOR SPLICING.
- E. BLOCKING: PROVIDE SUPPLEMENTAL BLOCKING AND SUPPORT UNDER THIS SECTION, AS REQUIRED TO SUPPORT FIXTURE FROM STRUCTURAL MEMBERS ADEQUATE FOR FIXTURE WEIGHT. REFER TO THE ARCHITECTURAL DETAILS FOR ACCEPTABLE METHODS FOR BLOCKING AND SUPPORT IN WALLS AND CEILINGS.
- F. CONNECTIONS: DO NOT USE FIXTURES AS PULL OR JUNCTION BOXES. DO NOT USE FLEX CONDUIT BETWEEN SEPARATED, SUSPENDED FIXTURES. SURFACE MOUNTED FIXTURES, SEPARATED BY NOT MORE THAN 6" IN UTILITY AREAS, ARE TO BE NIPPED TOGETHER. CONNECT FROM RECESSED FIXTURES TO FIXTURE OUTLET WITH 6" LENGTH OF FLEXIBLE CONDUIT AND CONDUCTORS.

G. LOCATION: LOCATE FIXTURE OUTLETS, RECESSED FIXTURES, AND DETERMINE THE

LENGTH OF CUSTOM, CONTINUOUS ROW COVE OR "REVERSE COVE" FIXTURES, BY

- REFERENCE TO ARCHITECTURAL REFLECTED CEILING PLANS AND DETAILS AND MEASUREMENT OF BUILDING CONSTRUCTION. DO NOT SCALE ELECTRICAL H. LAMPING: FOR INITIAL LAMPING OF OVERHEAD FIXTURES DURING CONSTRUCTION, OMIT DIFFUSER INSTALLATION. PRIOR TO FINAL ACCEPTANCE AND WHEN
- CONSTRUCTION LAMPS, RELAMP WITH NEW LAMPS AND INSTALL DIFFUSERS. DO NOT INSTALL EXPOSED FIXTURES, REFLECTORS OR TRIMS UNTIL ALL PLASTERING AND PAINTING THAT MAY MAR FIXTURE FINISH IS COMPLETED. REPLACE BLEMISHED, DENTED, DAMAGED OR UNSATISFACTORY FIXTURES AS

DIRECTED BY THE OWNER IN WRITING, CLEAN THE FIXTURES, REMOVE

J. SUPPORT ALL FIXTURES INDEPENDENT OF DUCTWORK OR PIPING.

### 3.17 GROUNDING AND BONDING

A. CONDUCTORS

B. INSTALLATION

- INSULATED CONDUCTORS: COPPER WIRE OR CABLE INSULATED FOR 600 V UNLESS OTHERWISE REQUIRED BY APPLICABLE CODE OR AUTHORITIES HAVING JURISDICTION.
- 1. CONDUCTORS: INSTALL SOLID CONDUCTOR FOR NO. 8 AWG AND SMALLER, AND CONDUCTORS FOR NO. 6 AWG AND LARGER, UNLESS OTHERWISE

2. INSTALL INSULATED EQUIPMENT GROUNDING CONDUCTORS WITH ALL FEEDERS AND

# BRANCH CIRCUITS.

- 3.18 ACCEPTABLE MANUFACTURERS
- A. MOLDED CASE CIRCUIT BREAKERS:
- 1. FOR BRANCH CIRCUIT PANELBOARDS: SAME AS PANELBOARD MANUFACTURER. B. WIRING DEVICES:
- 1. MAINTAINED SWITCHES: HUBBELL, LEVITON, PASS/SEYMOUR OR COOPER. 2. DUPLEX AND SINGLE RECEPTACLES: SPECIFICATION GRADE, HUBBELL, LEVITON,
- COOPER OR PASS/SEYMOUR. 3. PLATES - SMOOTH, SATIN FINISH, TYPE 302, 0.035" STAINLESS STEEL: HUBBELL,
- C. INSULATED BUSHINGS: O.Z. GEDNEY TYPES A, B AND COPPER LUG BLG, OR APPROVED EQUIVALENT.
- E. FLEX: TYPE U.A. WITH BUILT-IN BOND WIRE, AMERICAN FLEX CONDUIT, ANACONDA

D. EMT FITTINGS - STEEL RAINTIGHT: APPLETON, CROUSE-HINDS, STEEL CITY OR

F. STEEL OUTLET BOXES: 4: SQUARE BY 1-1/2" DEEP MINIMUM, APPLETON, STEEL CITY, THOMAS AND BETTS OR CROUSE-HINDS.

INSULATED WIRE, ANACONDA, OKONITE.

LEVITON, COOPER OR PASS/SEYMOUR.

THOMAS AND BETTS.

OR O.Z. GEDNEY.

G. 600V CONDUCTOR INSTALLATION ACCESSORIES:

1. STEEL SPRING CONNECTORS (NO. 8 AND SMALLER): SCOTCHLOCK TYPES R AND Y,

- IDEAL WIRFNUT 2. TAPE: SCOTCH #23 RUBBER TAPE AND #33 VINYL TAPE. SOLA BASIC,
- 3. SEALANT: SCOTCHKOTE. NO KNOWN EQUAL.
- 4. PULLING COMPOUND: POWDERED SOAPSTONE, IDEAL YELLOW 77, WIRELUBE, MINERALLAC #100, SIERRA-TOMIC. 5. CABLE SUPPORTS: O.Z. GEDNEY SPLIT WEDGE, KELLEMS CABLE CLAMPS.
- B. AFTERSET ANCHORS: EXPANSION SHIELD TYPE, HILTY KWIK BOLT, PHILLIPS "READHEAD" WEDGE TYPE.

C. CONDUCTORS - 600V AND BELOW; SOUTHWIRE, ENCORE WIRE, AMERICAN

CONDUIT BUSHINGS: SPECIFICATION GRADE, METAL INSULATING TYPE, INCLUDING GROUNDING BUSHINGS ON 1-1/4" AND LARGER; METALLIC INSULATING TYPE, 1 INCH AND SMALLER. METAL INSULATING TYPE BUSHING TO HAVE MOLDED ON

HIGH IMPACT PHENOLIC INSULATION. OZ/GEDNEY OR APPROVED EQUIVALENT.

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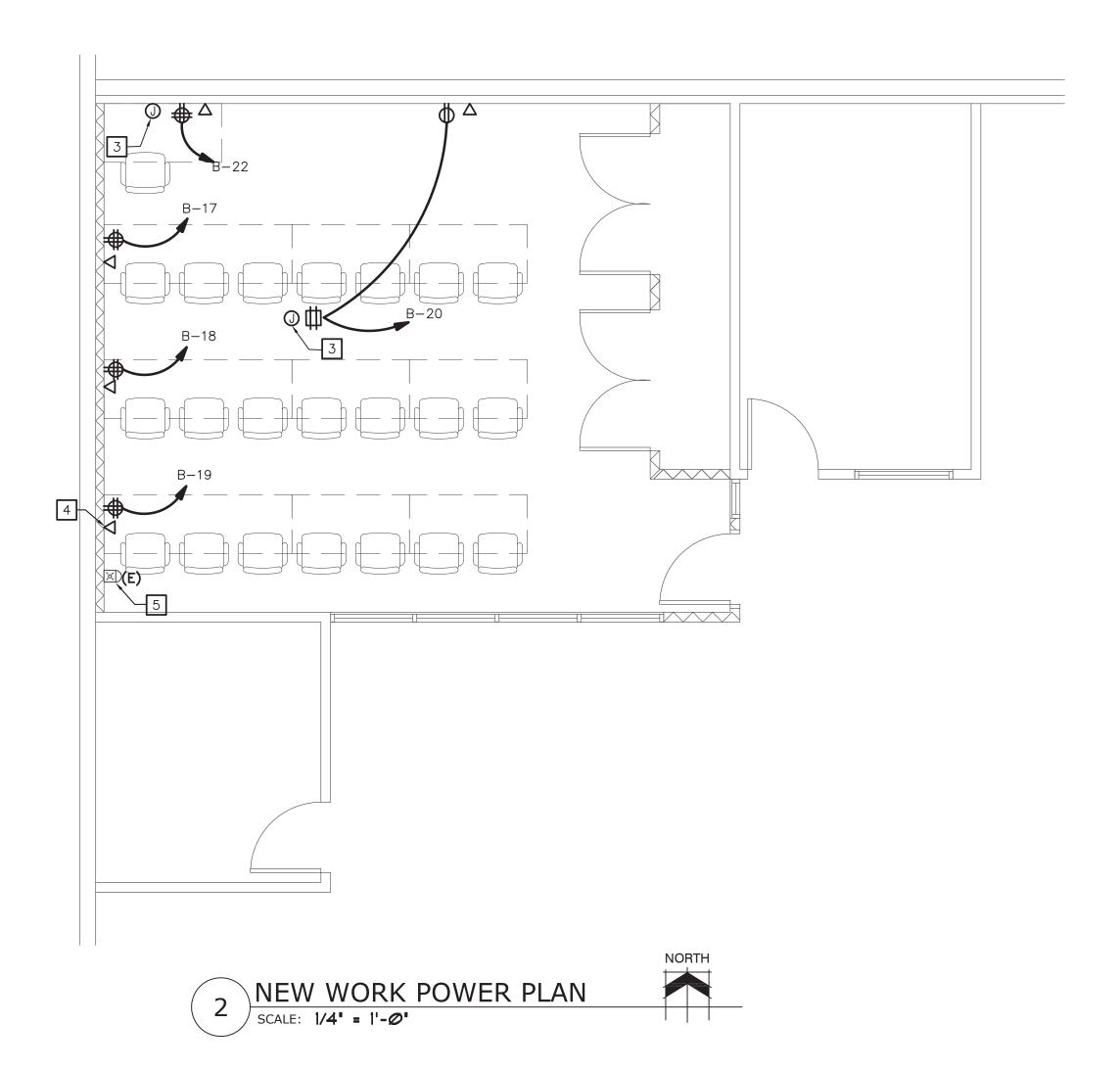
PROJECT MGR

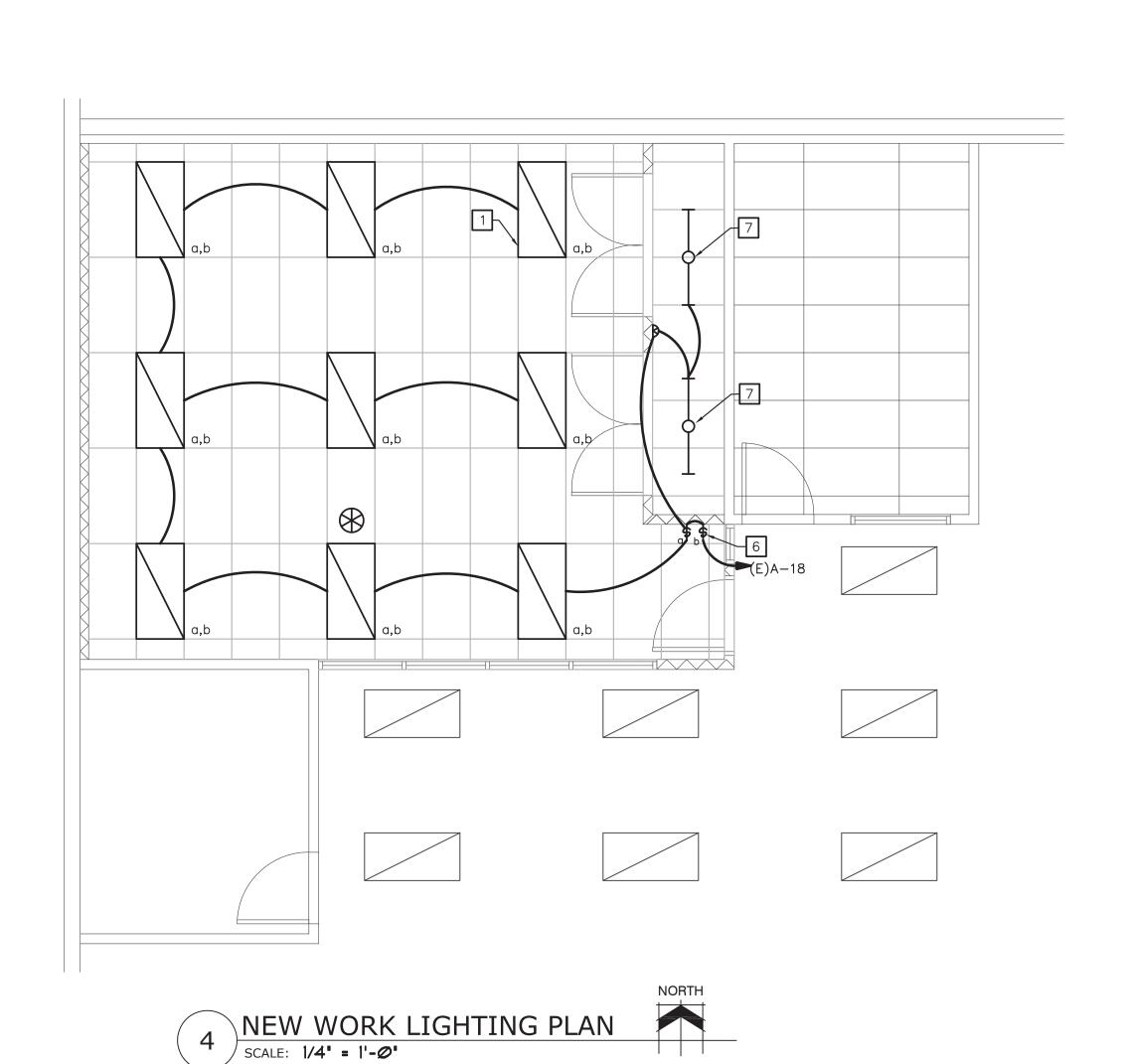
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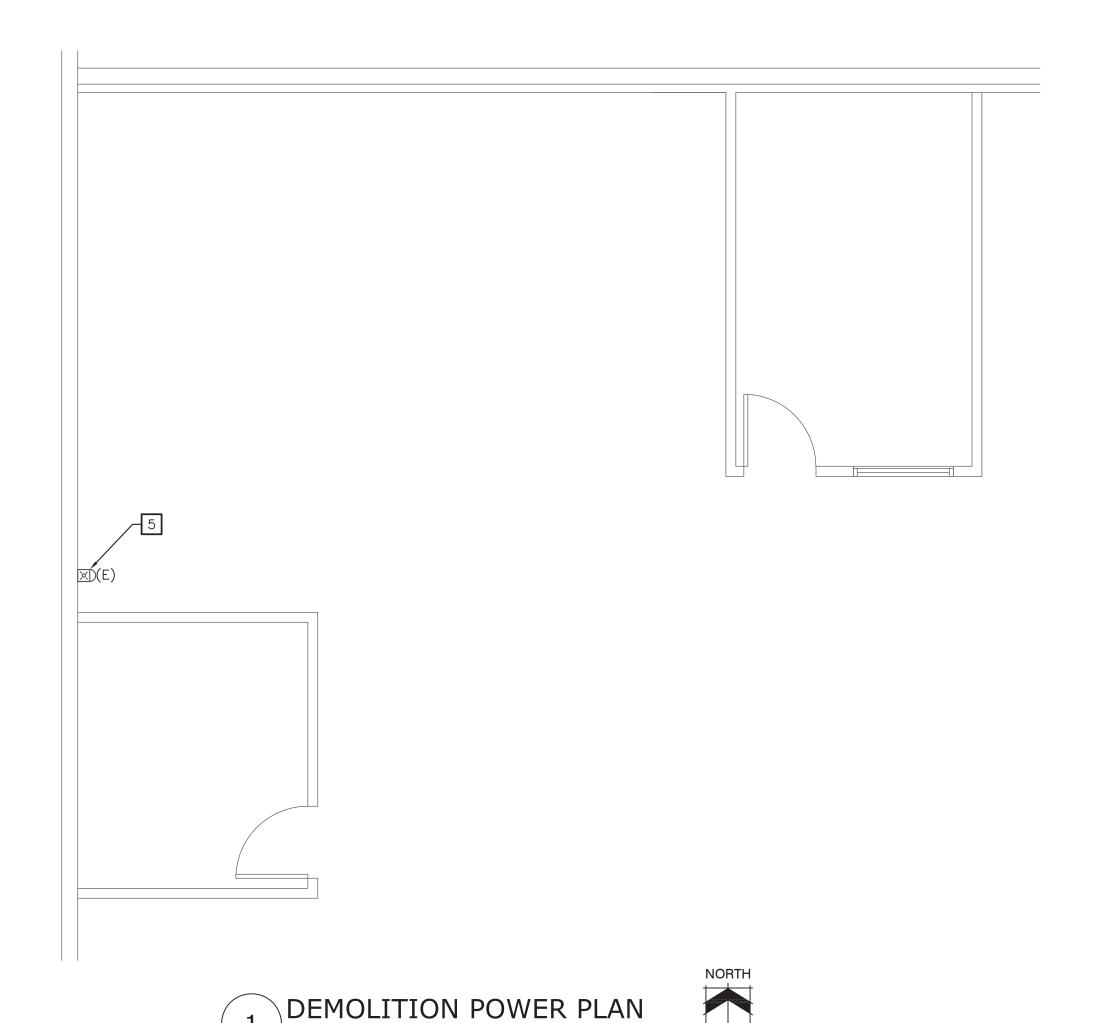
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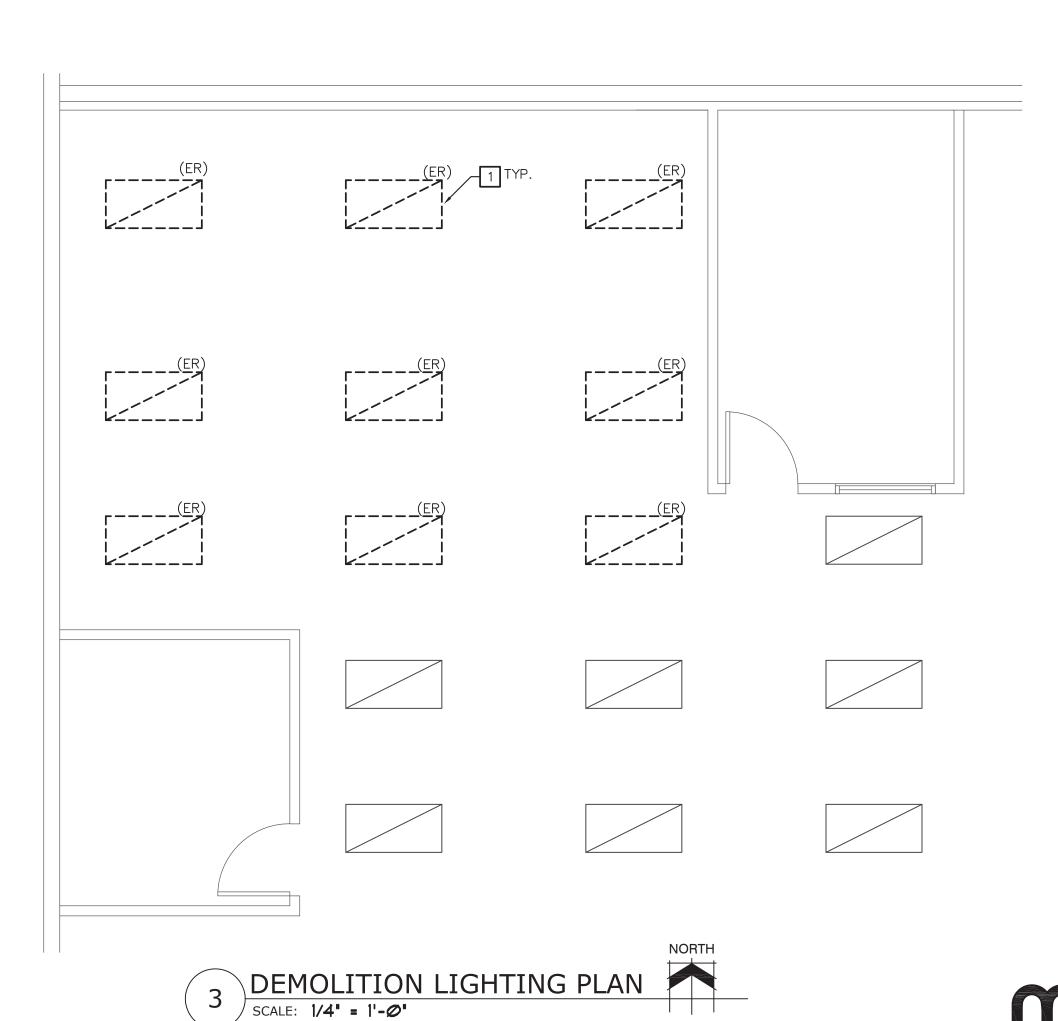
ME Engineers, Inc.







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



# GENERAL NOTES:

ALL EXPOSED CONDUIT SHALL BE ROUTED PERPENDICULAR, PARALLEL, AND TIGHT TO COLUMNS AND BEAMS. ALL EXPOSED CONDUIT ROUTING SHALL BE COORDINATED WITH ENGINEER AND ARCHITECT PRIOR TO INSTALLATION. NO ADDITIONAL COST TO OWNER WILL BE ALLOWED FOR RELOCATING CONDUIT DUE TO THE LACK OF COORDINATION WITH ARCHITECT.

. ALL BACK BOXES SHALL BE FLUSH MOUNTED UNLESS NOTED OTHERWISE. ALL VERTICAL SECTIONS OF CONDUIT SHALL BE CONCEALED. CONTRACTOR SHALL COORDINATE INSTALLATION OF CONDUIT AND BACK BOXES IN CONCRETE, MASONRY AND GYP. WALLS.

. DATA IS ROUGH—IN ONLY AT EACH DATA LOCATION PROVIDE J-BOX WITH 1"C TO ABOVE ACCESSIBLE CEILING UNLESS OTHERWISE NOTED. PROVIDE RACEWAY PATHWAY WHERE EXPOSED BACK TO IT CLOSET.

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# KEY NOTES

1 RELOCATE EXISTING FIXTURE. RECONNECT TO EXISTING LIGHTING CIRCUIT AND REVISE SWITCHING AS INDICATED. TYPICAL OF 9.

2 CEILING RECEPTACLE FOR PROJECTOR, COORDINATE EXACT LOCATION WITH EQUIPMENT PRIOR TO ROUGH-IN.

3 PROVIDE 1-1/2"C FROM PROJECTOR TO TEACHER DESK LOCATION FOR RUNNING AV CABLES.

4 PROVIDE 1-1/4"C FROM BOX TO ABOVE ACCESSIBLE CEILING FOR DATA ROUGH-IN.

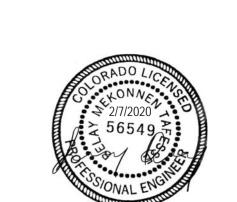
5 EXISTING FIRE ALARM HORN STROBE TO REMAIN.

6 NEW SWITCHING FOR SPACE SHALL SWITCH IN-BOARD AND OUT-BOARD LAMPS OF FIXTURES SEPARATELY.

7 PROVIDE 4' LED LENSED STRIPLIGHT 120V, 2491 LUMEN
OUTPUT, 3500K COLUMBIA
MPS OR EQUAL.

685 N MURRAY BLVD, COLORADO SPRINGS, CO 80915

02/07/2020 PROJECT MGR: PREPARED BY:



ISSUE / REVISION	
DATE:	DESCRIPTION:
SHEET TITLE	
ELECTRICAL FL	OOR PLANS

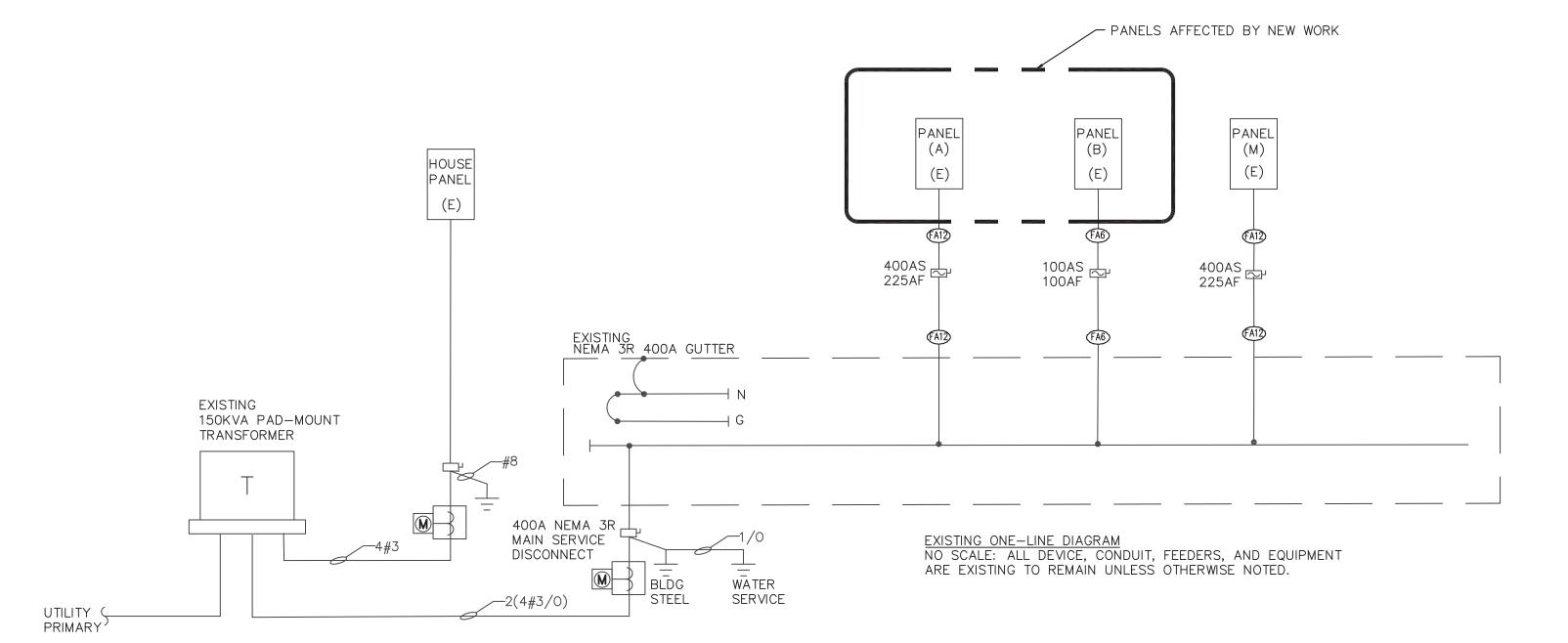
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<u>(E)</u>	(IST	ING)													
SUI	TE 1	65 BRIARGATE PLAZA						Α					M-E ENGINEERS, INC.		
LO	CATIO	ON: ELEC RM 109										208Y/120V, 3PH-4W+GND			
МО	UNT	ING: SURFACE											MLO		
RA.	ΓING	: 10K AIC											225A BUS		
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N	#	DESCRIPTION	TYPE	BRKR	PHA	SE A	PHA	ASE B	PHA	SE C	BRKR	TYPE	DESCRIPTION	#	N
Г	1	REC. RM 105	R	20A/1P	1680	1000			_		20A/1P	EQ	STORE FRON SIGN	2	
	3	REC. FOOF	R	20A/1P			360	600	1		20A/1P	EQ	FACP	4	
	5	REC. RM 101	R	20A/1P			_		1000	1900	20A/1P	LT	LIGHTING RM 101	6	
	7	REC RM 108	R	20A/1P	1680	1600					20A/1P	LT	LIGHTING RM 120	8	
	9	REFRIGERATOR	R	20A/1P			320	1500			20A/1P	LT	LIGHTING RM 115	10	
	11	BREAK RM	R	20A/1P			_		1180	1300	20A/1P	LT	LIGHTING RM 116	12	
	13	BREAK RM	R	20A/1P	1000	1300			_		20A/1P	LT	LIGHTING RM 103	14	
	15	REC RM 109	R	20A/1P			1260	1300			20A/1P	LT	LIGHTING RM 104	16	
	17	EWC	EQ	20A/1P			_		1200	1680	20A/1P	LT	LIGHTING RM 114	18	1
	19	REC RM 107	R	20A/1P	1800	800			_		20A/1P	LT	LIGHTING EM	20	
	21	SECURITY GATES	EQ	20A/1P			540	1600			20A/1P	LT	LIGHTING RM 105	22	
	23	AUTO DOORS	EQ	20A/1P			_		300	1200	20A/1P	LT	LIGHTING RM 108	24	
	25	REC. POWER POLE	R	20A/1P	1000	800			_		20A/1P	LT	LIGHTING RM 107	26	
	27	REC. READING LOUNGE	R	20A/1P			1260	1400			20A/1P	EQ	WOMEN'S HAND DRYER	28	
$\perp$	29	REC. CHILDRENS AREA	R	20A/1P			_		1500	1400	20A/1P	EQ	MEN'S HAND DRYER	30	
	31	REC. RM 116	R	20A/1P	1080				_		20A/1P		SPARE	32	
	33	REC. RM 116	R	20A/1P			720				20A/1P		SPARE	34	
$\perp$	35	REC. RM 116	R	20A/1P			_		1000		20A/1P		SPARE	36	
	37	REC. RM 116	R	20A/1P	1000				_		20A/1P		SPARE	38	
	39	UNKNOW LOAD	EQ	20A/1P			1000			_	20A/1P		SPARE	40	
	41	DDC	EQ	20A/1P					300		20A/1P		SPARE	42	
		TOTAL CONNECTE	D PHA	SE LOAD	147	14740 11860 13960 VA				VA					
				L	12:	122.8 98.8 116.3 AMPS				AMPS	PS				
												OPTIO	NS:		
						K	VA	AN	1PS	•		* ALL L	OADS ARE EXISTING U.O.N.		
	TOTAL CONNECTED LOAD					40	).56	11	2.6	1					
LONG CONTINUOUS LOADS * 25%					3.	.75	10	).4	1						
LARGEST MOTOR LOAD * 25%									1	NOTES:					
(RECEPTACLE LOADS - 10KVA) * 50%				-3	.92	-1	0.9	1		1. REVI	SED LOAD ON EXISTING CIRCUIT.				
KITCHEN LOADS * 0%															
				Т	OTAL LOAD	40	).39	11	2.1	]					

LOAD ADDED TO PANEL IS	S 80VA(0.2A	AT 208V, 3 PHASE)
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	STING)						 В							
	E 165 BRIARGATE PLAZA						D					M-E ENGINEERS, INC.		
	ATION:											208Y/120V, 3PH-4W+GND		
	NTING: SURFACE											LUG MCB		
AT	NG: 10K AIC					,	/ A					100A BUS		
ıΤ	# DESCRIPTION	TYPE	BRKR	PHA	SE A		/A SE B	PHA	SE C	BRKR	TYPE	DESCRIPTION	#	N
-	1 REC RM 104	R	20A/1P	1300	1800		.0		.02 0	20A/1P	R	REC POWER POLE	2	1
-	3 REC. RM 104	R	20A/1P		1000	1300	1000			20A/1P	R	REC POWER POLE	4	t
+	5 REC RM 104	R	20A/1P					1680	1500	20A/1P	R	REC POWER POLE	6	t
-	7 REC RM 104	R	20A/1P	180	1260	1		)		20A/1P	EQ	WIRELESS GUB J-BOXES	8	T
T	9 REC RM 104	R	20A/1P			500	500			20A/1P	LT	STUDY LTS & LANGUAGE LTS	10	T
T	11 REC RM 104	R	20A/1P				•	1300	1400	20A/1P	EQ	HOT WATER HEATER	12	Γ
T	13 REC RM 113	R	20A/1P	1200	1000	1				20A/1P	R	IT CLOSET REC.	14	
T	15 COPIER (NEW)	R	20A/1P			1200	1200			20A/1P	R	COPIER FRONT ENT.	16	
	17 REC LEARNING LAB	R	20A/1P					600	600	20A/1P	R	REC LEARNING LAB	18	
I	19 REC LEARNING LAB	R	20A/1P	600	800					20A/1P	EQ	PROJECTOR(LEARNING LAB)	20	
	21 SPACE						600			20A/1P	R	REC LEARNING LAB	22	
	23 SPACE					_						SPACE	24	
	25 SPACE											SPACE	26	
1	27 SPACE											SPACE	28	L
	29 SPACE											SPACE	30	
	TOTAL CONNE	CTED PHA	SE LOAD	81	40	63	300	70	080	VA				
				67	7.8	52	2.5	59	9.0	AMPS				
											OPTIO	NS:		
						VA		IPS	1		* ALL L	OADS ARE EXISTING U.O.N.		
TOTAL CONNECT							.52 59		59.7					
				OADS * 25%	0.	13	C	.3	1					
LARGEST MOTOR LOA								-	NOTES:					
		(RECEPTACL		,	-3	.78	-1	0.5	4		T. PRO	VIDE NEW BREAKER MATCH EXISTING.		
				LOADS * 0%					-					
			•	TOTAL LOAD	17	.87	4	9.6	J					

LOAD ADDED TO PANEL IS 2000VA(5.5A AT 208V, 3 PHASE).



LOAD SUMMARY FOR EXISTING 400A, 208V, 3PHASE SERVICE GUTTER

EXISTING CALCULATED LOAD. 325.9 AMPS. LOAD ADDED FROM NEW WORK 5.7 AMPS. FINAL LOAD ON SERVICE. 331.6 AMPS.

FEEDER SCHEDULE							
(*) KEY	SETS	CONDUCTOR SIZE & QTY.	GND	CONDUIT			
FA6	1	4#3	#8	1-1/4"			
FA12	1	4#4/0	#4	2-1/2"			



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PROJECT INFO

# RUTH HOLLEY LIBRARY NEW LEARNING LAB

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02/07/2020

DATE: PROJECT MGR: PREPARED BY:

SEAL



IS	SUE / REVISION		
	DATE:	DESCRIPTION:	

SHEET TITLE

ELECTRICAL ONE-LINE AND SCHEDULES

E6.0

