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HARRIS COUNTY APPRAISAL DISTRICT

13013 NORTHWEST FREEWAY HOUSTON, TX 77040

LEVEL 1, WEST SIDE

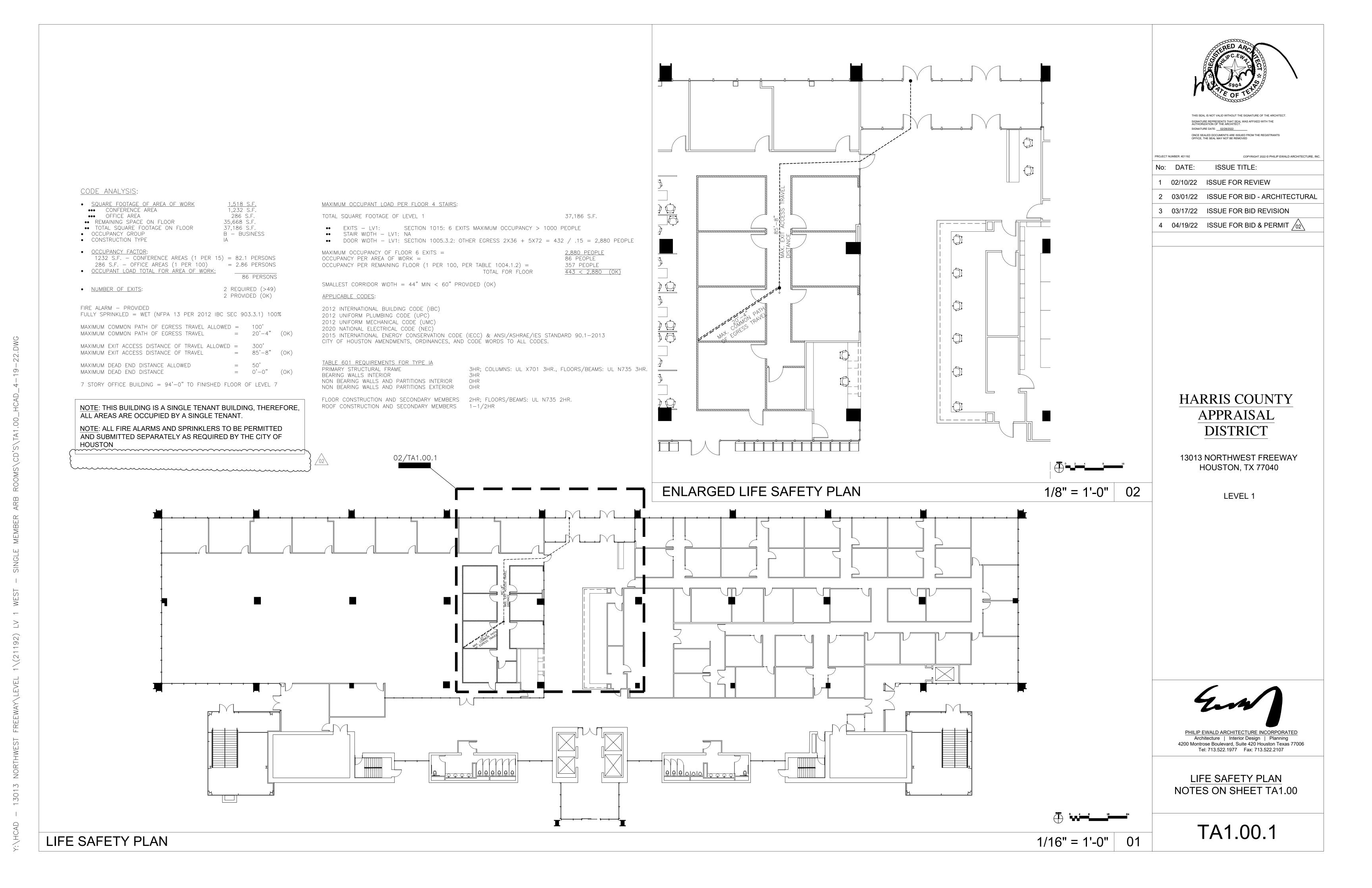
SINGLE MEMBER ARB ROOMS

ISSUE FOR BID & PERMIT 04-19-22

PHILIP EWALD ARCHITECTURE INCORPORATED ARCHITECTURE INTERIOR DESIGN PLANNING 4200 MONTROSE BOULEVARD, SUITE 420 HOUSTON, TEXAS 77006 TEL: 713.522.1977 FAX: 713.522.2107 WWW.PHILIPEWALD.COM

PEAI PROJECT NUMBER: 21192 CITY OF HOUSTON PROJECT NUMBER: 22038256 TDLR PROJECT NUMBER: TABS2022016531





GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE APPLICABLE PORTIONS OF THE ORIGINAL "BASE BUILDING" SPECIFICATIONS UNLESS STRICTER REQUIREMENTS ARE NOTED OTHERWISE. IN THE EVENT THAT THE ORIGINAL "BASE BUILDING" SPECIFICATIONS ARE NOT AVAILABLE, ALL WORK SHALL CONFORM TO THE APPLICABLE PORTIONS OF PHILIP EWALD ARCHITECTURE, INC. STANDARD SPECIFICATIONS WHICH ARE AVAILABLE FOR REVIEW IN THE ARCHITECT'S OFFICE. 2. ALL WORK SHALL BE COVERED BY THE AMERICAN INSTITUTE OF ARCHITECTS GENERAL CONDITIONS A-201, LATEST EDITION.

ALL WORK SHALL BE CONSTRUCTED IN STRICT CONFORMANCE WITH THE FOLLOWING CODES WITH ANY AMENDMENTS WHETHER REQUIRED BY THE LOCAL GOVERNING ORGANIZATION OR NOT: THE CITY OF HOUSTON BUILDING CODE, 2012 INTERNATIONAL BUILDING CODE, 2012 UNIFORM MECHANICAL CODE, 2012 UNIFORM PLUMBING CODE, 2020 NATIONAL ELECTRIC CODE, 2012 INTERNATIONAL FIRE CODE, 2015 IECC OR 2013 ASHRAE 90.1 ENERGY CODE PURSUANT TO SECTION 19.53 OF CHAPTER 34 TEXAS ADMINISTRATIVE CODE, AND THE AMERICANS WITH DISABILITIES ACT TITLES, II, III; ALL OF THE ABOVE, THE LATEST EDITION.

4. ALL WORK SHALL BE GUARANTEED BY THE CONTRACTOR TO BE FREE FROM DEFECTS IN WORKMANSHIP, DESIGN, AND MATERIALS FOR A PERIOD OF ONE YEAR. 5. ALL MATERIALS SHALL BE INSTALLED IN STRICT CONFORMANCE WITH MANUFACTURER'S LATEST INSTRUCTIONS AND PROCEDURES.

6. PRIME ALL MATERIALS FOR PROPER ADHESION OF FINISH COAT AS RECOMMENDED BY MANUFACTURER. IF EXISTING COLORS WILL ALTER FINAL APPEARANCE, PRIME EXISTING MATERIALS TO ACHIEVE UNIFORM APPEARANCE.

7. SUBSTITUTIONS OF MATERIALS WITHOUT PRIOR REVIEW AND ACCEPTANCE BY THE ARCHITECT ARE PROHIBITED. 8. CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS

DURING THE BIDDING, PRIOR TO THE START OF CONSTRUCTION AND SHALL NOTIFY THE ARCHITECT IF ANY DISCREPANCIES OR CONFLICTS EXISTING BETWEEN THE PLANS AND THE EXISTING CONDITIONS. 9. CONTRACTOR SHALL EXAMINE DURING BIDDING PHASE, PRIOR TO THE START OF CONSTRUCTION, THE AREA ABOVE THE CEILING TO DETERMINE IF THERE ARE

10. REFER TO "BASE BUILDING" DRAWINGS FOR ALL NON-TENANT WORK IN CORE AREA.

ANY CONFLICTS BETWEEN ANY NEW OR RELOCATED LIGHT FIXTURES AND ANY

EXISTING DUCTS, PIPES, CONDUITS OR OTHER STRUCTURE OR DEVICE WHICH

11. ALL CONSTRUCTION MUST BE NEW UNLESS OTHERWISE SPECIFIED.

WILL INTERFERE WITH THE FIXTURES PROPER INSTALLATION.

12. THE ABSENCE OF A DESIGNATION SYMBOL OF A SCHEDULED PARTITION, FINISH, DOOR AND/OR HARDWARE SET DENOTES THAT THOSE ITEMS ARE BUILDING STANDARD, FOR BUILDING STANDARD INFORMATION REFER TO SHEET

13. REFINISH AND/OR REPLACE EXISTING CONSTRUCTION TO THE EXTEND THAT THE FORMER JUNCTION BETWEEN EXISTING CONSTRUCTION TO REMAIN AND NEW CONSTRUCTION IS UNIDENTIFIABLE.

14. EXISTING CONSTRUCTION WHERE NOTED TO REMAIN MUST MATCH THE REQUIREMENTS AND APPEARANCE FOR SIMILAR NEW CONSTRUCTION. IF THE EXISTING CONSTRUCTION CAN NOT BE MODIFIED TO MEET THE REQUIREMENTS AND APPEARANCE FOR SIMILAR NEW CONSTRUCTION, IT MUST BE DEMOLISHED AND REPLACED WITH NEW CONSTRUCTION.

15. FIRE STOPPING REQUIREMENTS: PENETRATIONS THROUGH RATED WALLS AND FLOORS SHALL BE SEALED WITH A MATERIAL CAPABLE OF PREVENTING THE PASSAGE OF FLAMES AND HOT GASSES WHEN SUBJECTED TO THE REQUIREMENTS OF TEST STANDARD SPECIFICATION FOR FIRE STOPS ASTM-E-814. MATERIAL MUST BE RED IN COLOR.

16. IF THERE IS A CONFLICT IN THE PLANS AMONG ANY TRADES (MEP, STRUCTURAL, ETC) THE CONTRACTOR SHALL PRICE THE MOST EXPENSIVE COMBINATION. THE CONTRACTOR SHALL ALSO BRING THE CONFLICT TO THE ARCHITECTS ATTENTION.

17. ANY ADDED ROOMS THAT CONTAINS WATER GENERATING EQUIPMENT MUST BE SEALED AT FLOOR WITH 1" BEAD OF WATERPROOFING MATERIAL AT FLOOR AND PARTITION CONNECTION.

PARTITIONS:

1. ALL PARTITIONS ARE BUILDING STANDARD TYPE $\langle 1 \rangle$ UNLESS NOTED OTHERWISE. REFER TO 01/TD1.00 FOR PARTITION TYPES. 2. ALL PARTITIONS ARE TO BE LOCATED ON MULLION CENTERLINES UNLESS DIMENSIONED OTHERWISE. OTHER PLAN DIMENSIONS ARE TO FACE OF GYP. BD.

3. WALL TERMINATION AT THE CURTAIN WALL SHALL BE CONSTRUCTED ACCORDING TO ONE OF THE DETAILS 02/TD1.00 DEPENDING ON THE CONDITION.

4. PARTITIONS ARE INDICATED ON THE PLAN THUSLY

EXISTING PARTITION

EXISTING CONSTRUCTION TO BE REMOVED 5. CONTRACTOR SHOULD VERIFY ALL EXISTING CONSTRUCTION PRIOR TO BIDDING AND MAKE THE APPROPRIATE ADJUSTMENTS FOR ANY

DISCREPANCIES. DOORS, FRAMES AND HARDWARE:

1. ALL DOORS, FRAMES AND HARARE SHALL COMPLY WITH THE REQUIREMENTS OF THE CITY OF HOUSTON BUILDING CODE AND THE INTERNATIONAL BUILDING CODE, LATEST EDITION.

2. ALL GLASS IN IMPACT AREAS SHALL COMPLY WITH SECTION 5406 AND USC IMPACT STANDARD 54-2 PART 1.

3. DOOR SYMBOLS ARE INDICATED THUSLY ON THE PLANS:

OPENING SIZE AND FUNCTION RE: 16/TD1.00 DOOR MATERIAL DESCRIPTION RE: 16/TD1.00 HARDWARE SET RE: 09/TD1.00

4. ALL DOORS ARE BUILDING STANDARD TYPE $\binom{1A}{1}$ UNLESS NOTED

OTHERWISE 5. EXISTING DOORS ARE INDICATED THUSLY (E)

6. WHERE A CLOSER IS SPECIFIED, PROVIDE A PARALLEL ARM IF REQUIRED, SO THAT CLOSER BODY IS LOCATED ON THE LEAST PUBLIC SIDE OF THE DOOR, NEVER ON THE CORRIDOR SIDE. CLOSERS SHALL NOT BE INSTALLED WITH THROUGH BOLTS.

7. DOOR OPENINGS SHALL BE PROTECTED BY TIGHT FITTING SMOKE, AND DRAFT-CONTROL ASSEMBLIES HAVING A FIRE-PROTECTION RATING OF NOT LESS THAN 20 MINUTES WHEN TESTED IN ACCORDANCE WITH SECTION 715, 2012 INTERNATIONAL BUILDING CODE WITH CITY AMENDMENTS

ROOM NUMBERS AND FINISHES:

1. ALL FLOOR FINISHES, WALL FINISHES, AND BASE TYPE ARE THE BUILDING STANDARD FINISH AS NOTED IN THE FINISH SCHEDULE UNLESS OTHERWISE NOTED ON THE PLANS, REFER TO 04/TD1.00 FOR FINISH SCHEDULE.

2. THE ARCHITECT IS SOLELY RESPONSIBLE FOR SELECTING THE FINISHES.

3. ALL VINYL COMPOSITION FLOOR TILES, IF SCHEDULES, SHALL BE LAID WITH PATTERN IN ONE DIRECTION. DIRECTION SHALL BE DETERMINED BY ARCHITECT.

4. ROOM NUMBERS AND SPECIAL FINISHES ARE INDICATED ON THE PLANS



5. SPECIAL WALL FINISHES ARE INDICATED ON THE PLANS THUSLY / SCHEDULED PAINT OR WALL FINISH

FURNITURE, EQUIPMENT AND MILLWORK:

1. ALL FURNITURE SHOWN ON THE PLANS IS PROVIDED AND INSTALLED BY THE TENANT UNLESS NOTED OTHERWISE.

2. ALL EQUIPMENT SHOWN ON THE PLANS IS PROVIDED AND INSTALLED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. 3. ALL MILLWORK SHOWN ON THE PLANS IS PROVIDED AND INSTALLED BY THE CONTRACTOR. ALL MILLWORK SHALL COMPLY WITH THE REQUIREMENTS OF THE AWI FOR A CUSTOM INSTALLATION UNLESS NOTED OTHERWISE.

5. TYPICAL INTERIOR WALL AND/OR MILLWORK ELEVATION SYMBOL IS NOTED

4. AT ALL EXISTING MILLWORK, IF ANY, CONTRACTOR SHALL SQUARE ALL

1. ALL DOOR HARDWARE IS TO BE CHECKED, LUBRICATED AND ADJUSTED PRIOR TO MOVE IN. 2. ALL CEILING AND LIGHT FIXTURES ARE TO BE CHECKED, LUBRICATED AND ADJUSTED PRIOR TO MOVE IN.

3. COMPLETE AIR BALANCING IN ALL SPACES PRIOR TO MOVE IN. 4. PRIOR TO MOVE IN, CONTRACTOR SHALL MAKE FINAL INSPECTION AND RECORD ALL ITEMS OF DEFICIENCY BY ROOM NUMBER. THIS LIST SHALL BE FORWARDED TO THE OWNER AND THE ARCHITECT WITH A REQUEST FOR PUNCH LIST REVIEW.

<u>ACCESSIBILITY</u>

1. THE MAXIMUM FORCE FOR PUSHING OR PULLING OPEN A DOOR SHALL BE FIVE LBF. (FIRE DOOR SHALL HAVE THE MINIMUM OPENING FORCE ALLOWABLE BY THE APPROPRIATE ADMINISTRATIVE AUTHORITY). ON A DOOR WITH A CLOSER THE SWEEP PERIOD OF THE CLOSER SHALL BE ADJUSTED SO THAT FROM AN OPEN POSITION OF 90 DEGREES, THE TIME REQUIRED TO MOVE THE DOOR TO A POSITION OF 12 DEGREES FROM THE LATCH IS 5 SECONDS MINIMUM.

2. CHANGES IN LEVEL: ACCESSIBLE ROUTES OF TRAVEL AND ACCESSIBLE SPACES WITHIN BUILDINGS SHALL HAVE CONTINUOUS COMMON FLOOR OR RAMP SURFACES. ABRUPT CHANGES IN HEIGHT GREATER THAN 1/4 INCH SHALL BE BEVELED TO 1 VERTICAL IN 2 HORIZONTAL. CHANGES IN LEVEL GREATER THAN 1/2 INCH SHALL BE ACCOMPLISHED BY MEANS OF RAMP MEETING THE REQUIREMENTS OF THE TEXAS ACCESSIBILITY STANDARDS (TAS) OF THE ARCHITECTURAL BARRIERS ACT ARTICLE 9102, TEXAS CIVIL STATUTES.

3. ALL FLOORING SURFACES SHALL BE SLIP RESISTANT AS REQUIRED BY TAS 302.1. HARD FLOORING SURFACES SHALL BE A MINIMUM OF P3 AND IN THE EMPLOYEE AREAS A MINIMUM OF P5 SLIP RESISTANCE PER THE SAHB198:2014 GUIDE TO THE SPECIFICATION AND TESTING OF SLIP RESISTANCE OF PEDESTRIAN SURFACES.

RENOVATION NOTES:

1. ANY WORK PERFORMED OUTSIDE THE PROJECT AREA SHALL BE SCHEDULED WITH BUILDING MANAGEMENT, THE AREA IN WHICH THE WORK OCCURS SHALL BE LEFT IN A BROOM SWEPT, CLEAN CONDITION WITH ALL DEBRIS, CONSTRUCTION MATERIAL, TOOLS, ETC., REMOVED AT THE END OF THE ALLOWED TIME PERIOD. ANY DISRUPTED AREA OUTSIDE OF THE PROJECT AREA SHALL BE RETURNED IN ITS ORIGINAL CONDITION WHEN ALL WORK IS FINISHED IN THAT AREA. INTERIM WORK STOPPAGES SHALL LEAVE ANY WALL, CEILING OR FLOOR IN A SECURELY COVERED CONDITION.

2. VERIFY WITH BUILDING MANAGEMENT THE LOCATION WHERE ALL MATERIAL AND EQUIPMENT WILL BE DELIVERED AND REMOVED.

3. THE CONTRACTOR SHALL SUBMIT TO THE OWNER FOR HIS/HER REVIEW, PRIOR TO CONSTRUCTION ALL SHOP DRAWINGS REQUIRED, SAMPLES OF ALL FINISHES, SAMPLES OF ACTUAL COLORS, SAMPLES OF ALL MATERIALS THAT ARE MATCHING EXISTING MATERIALS AND SAMPLES OF ALL GLASS.

4. WHERE EXISTING CONSTRUCTION MATERIALS ARE REUSED AND NEW CONSTRUCTION MATERIALS ARE REQUIRED, NEW MATERIALS MUST MATCH EXISTING MATERIALS, IN THEIR ORIGINAL NEW CONDITION, EXCEPT WHERE REVIEWED AND APPROVED BY THE OWNER IN ADVANCE.

5. WHERE EXISTING WALLS ARE TO REMAIN AND NEW WALLS ARE CONSTRUCTED SO THEY ALIGN WITH EXISTING, CONTRACTOR SHALL PROVIDE THE SAME TEXTURE ON THE NEW WALL TO MATCH EXISTING WITH APPLICATION OF SCHEDULED FINISH ON WALLS. THERE SHALL NOT BE A NOTICEABLE DIFFERENCE BETWEEN FINISH ON EXISTING AND FINISH ON NEW

6. CONTRACTOR SHALL INSTALL CONTINUOUS MATERIALS IN THE LONGEST OR LARGEST LENGTHS OR WIDTHS AVAILABLE UNLESS SPECIFICALLY NOTED OTHERWISE. SCRAP OR SHORT MATERIAL ARE NOT TO BE PIECED TOGETHER TO FORM LONG LENGTHS.

7. CONTRACTOR SHALL PROTECT THE SPACE BELOW FROM DAMAGE OR INJURY FROM FALLING DEBRIS ARISING FROM THE CONTRACTION ON THE FLOOR ABOVE. ALL DRILLING OR OTHER ACTIVITY WHERE THERE IS A POTENTIAL FOR FALLING DEBRIS SHALL BE DONE AFTER HOURS AND ONLY AFTER VERIFICATION THAT THE SPACE BELOW IS UNOCCUPIED.

8. PRIOR TO THE SHUT OFF OF EXISTING CIRCUIT BREAKERS, THE CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE BUILDING MANAGEMENT ANY PLANNED SHUT OFF EVEN IF CIRCUIT BREAKERS ONLY CONTROL WORK WITHIN CONSTRUCTION AREA.

9. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE OWNER'S BUILDING RULES AND REGULATIONS AND ENSURE COMPLIANCE DURING ALL PROJECT PHASES.

DEMO LIGHT SWITCH EXISTING LIGHT SWITCH

LIGHT SWITCH 3-WAY LIGHT SWITCH

DUAL SWITCH LIGHT FIXTURE SWITCH TO PROVIDE 2 LEVELS OF LIGHTING WITHIN EACH 2 TUBE FIXTURE

DIMMER SWITCH

OCCUPANCY SENSOR

DEMO LIGHT FIXTURE

EXISTING 2X4 FIXTURE, TO REMAIN

RELOCATED 2X4 FIXTURE

WALL MOUNTED LIGHT SCONCE

EXISTING RECESSED DOWN LIGHT NEW RECESSED DOWN LIGHT TO MATCH EXISTING SUPPLY AIR GRILLE

RETURN AIR GRILLE SPEAKER

EXISTING EMERGENCY EXIT SIGN NEW EMERGENCY EXIT SIGN

I. CONTRACTOR SHALL REPAIR OR REPLACE ALL DAMAGED EXISTING SUSPENDED CEILING SYSTEM PARTS DUE TO DEMOLITION

2. INSTALL HOLD DOWN CLIPS AT PERIMETER PARTITIONS AND FOR ALL CEILING TILES LESS THAN FULL SIZE. CABLE CONDUITS, ETC. SHALL NOT BE SUPPORTED BY CEILING STRUCTURE.

3. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATION OF EXISTING MAIN TEES BEFORE COMMENCING WITH INSTALLATION OF LIGHT FIXTURES. ARCHITECT SHALL BE NOTIFIED OF ANY DISCREPANCIES.

4. PAINT ALL CEILING AIR GRILLES AND SLOT DIFFUSER TRIM EDGES WHITE TO MATCH ACOUSTICAL CEILING TILES. VERIFY WITH ARCHITECT. 5. USE ONE CONTINUOUS WALL PLATE WHERE MULTIPLE LIGHT SWITCHES

AND/OR EXHAUST FAN SWITCHES OCCUR. 6. ALL WALL PLATES SHALL BE BUILDING STANDARD.

7. ACOUSTICAL TILE SHALL BE BUILDING STANDARD, ARMSTRONG 1728AN FINE FISSURED WHITE, UNLESS NOTED OTHERWISE.

FIRE PROTECTION NOTES:

 FOR SPRINKLER FIRE PROTECTION FOR THIS SPACE, COMPLY WITH REQUIREMENTS NOTED ADJACENT TO THE BOX CHECKED. IF NO BOX IS CHECKED, CONTACT ARCHITECT FOR CLARIFICATION.

> SPACE DOES NOT REQUIRE SPRINKLER FIRE PROTECTION INSTALL & PROVIDE FIRE SPRINKLERS TO PROVIDE FULL

COVERAGE PER NFPA 13. SPACE IS CURRENTLY SPRINKLED. RENOVATED & ADD HEADS AS REQUIRED TO PROVIDE FULL COVERAGE PER

GENERAL MECHANICAL NOTES:

1. CONTRACTOR TO REFER TO THE ENGINEERED MECHANICAL DESIGN DOCUMENTS FOR THE SCOPE OF WORK.

ELECTRICAL LEGEND:

NOTE: IF SYMBOLS BELOW HAVE A 'E' NEXT TO THEM IT DESIGNATES ITEM AS EXISTING.

NEW BUILDING STANDARD DUPLEX CONVENIENCE OUTLET - 110 VOLTS

NEW SPECIAL ELECTRICAL OUTLET: SEE PLANS

FOR REQUIREMENTS NEW QUADRAPLEX CONVENIENCE OUTLET

DED OUTLET - 110 VOLTS NEW DEDICATED DUPLEX CONVENIENCE

OUTLETS IN CENTER - 110 VOLTS

① NEW JUNCTION BOX, SEE PLANS FOR REQUIREMENTS

NEW FLUSH FLOOR QUADRAPLEX OUTLET

NEW FLUSH FLOOR TELEPHONE/DATA OUTLETS AND QUADRAPLEX ELECTRICAL OUTLET IN ONE CORE

NEW FLUSH FLOOR TELEPHONE, DATA & POWER TO BE DISTRIBUTED IN WORKSTATIONS. COORDINATE WITH FURNITURE VENDOR/ INSTALLER AS NECESSARY (EACH WORK STATION TO GET (X) CAT 5e DATA LINES)

NEW DATA/COMMUNICATIONS OUTLET WITH PULL STRING, RING AND/OR CONDUIT AS REQUIRED BY TENANT. COORDINATE WITH COMMUNICATIONS VENDOR

NEW DATA/COMMUNICATIONS/CABLE OUTLET WITH PULL ✓ STRING, RING AND/OR CONDUIT AS REQUIRED BY TENANT FOR TELEVISIONS. PROVIDE & INSTALL (X) 5e AND (X) HDMI HOOKUP

NEW DATA/COMMUNICATIONS OUTLET TO BE DISTRIBUTED IN WORKSTATIONS. COORDINATE WITH FURNITURE VENDOR/ INSTALLER AS NECESSARY (EACH WORK STATION TO GET X -5e DATA LINES)

CARD READER BY OTHERS - CONTRACTOR TO PROVIDE CONDUIT, RING AND STRING (MOUNT 42" TO HIGHEST OPERABLE PART, TYP.)

INTERCOM BY OTHERS — CONTRACTOR TO PROVIDE CONDUIT, RING AND STRING (MOUNT 42" TO HIGHEST OPERABLE PART, TYP.)

POWER OUTLET STRIP

▶ POWER POLE

INDICATES MOUNTING HEIGHT TO CENTER OF DEVICE +XX" FROM A.F.F. IF NO SYMBOL IS PROVIDED MOUNTING HEIGHT IS 17" A.F.F

1. BACK-TO-BACK ELECTRICAL OUTLETS AND TELEPHONE OUTLETS SHALL BE STAGGERED W/ A FULL HEIGHT STUD BETWEEN THEM TYPICALLY.

ACCESSIBLE ALARM NOTE:

 CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN AND INTEGRATION INTO THE BUILDING ALARM SYSTEM OF ANY AUDIBLE EMERGENCY ALARMS AN/OR VISUAL ALARM SIGNAL APPLIANCES REQUIRED BY THE CITY OF HOUSTON, TEXAS ACCESSIBILITY STANDARDS AND THE AMERICANS WITH DISABILITY ACT.

2. AS REQUIRED BY NOTE 1, ALL AUDIBLE EMERGENCY ALARMS AND/OR VISUAL ALARM SIGNAL APPLIANCES TO BE WHITE AND INSTALLED ON THE CEILING THOUGH OUT THE SPACE, TYPICAL.

GENERAL ELECTRICAL NOTES:

 CONTRACTOR TO REFER TO THE ENGINEERED ELECTRICAL DESIGN. DOCUMENTS FOR THE SCOPE OF WORK.

HARRIS COUNTY **APPRAISAL**

SIGNATURE REPRESENTS THAT SEAL WAS AFFIXED WITH THE AUTHORIZATION OF THE ARCHITECT.

ONCE SEALED DOCUMENTS ARE ISSUED FROM THE REGISTRANTS OFFICE, THE SEAL MAY NOT BE REMOVED

ISSUE TITLE:

2 03/01/22 ISSUE FOR BID - ARCHITECTURAL

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SIGNATURE DATE: 02/28/2022

02/10/22 ISSUE FOR REVIEW

3 03/17/22 ISSUE FOR BID REVISION

4 04/19/22 ISSUE FOR BID & PERMIT

PROJECT NUMBER: #21192

No: DATE:

13013 NORTHWEST FREEWAY HOUSTON, TX 77040

DISTRICT

LEVEL 1

RCP NOTES **ELECTRICAL NOTES**

DEMOLITION PLAN NOTES:

1. COORDINATE REMOVAL OF ITEMS WITH BUILDING MANAGEMENT.

MANAGEMENT TO ENSURE NO INTERRUPTION IN UTILITY SERVICE.

- 2. ANY UTILITY SHUT-OFFS MUST BE COORDINATED WITH THE BUILDING
- 3. THE CONTRACTOR IS RESPONSIBLE FOR THE DEMOLITION OF EVERYTHING THAT IS REQUIRED TO CONSTRUCT THE SPACES SHOWN ON THESE PLANS. THE DEMOLITION PLANS ARE SHOWN AS A GUIDE ONLY. IF ADDITIONAL DEMOLITION IS REQUIRED, IT IS AT THE CONTRACTOR'S SOLE EXPENSE. REFER TO GENERAL

NOTES ON SHEET TA1.00. 4. THE CONTRACTOR SHALL REMOVE EXISTING WALL FINISHES WHERE NEW FINISHES ARE SCHEDULED AND PREPARE WALLS TO RECEIVE NEW FINISHES,

5. THE CONTRACTOR SHALL REMOVE EXISTING FLOOR FINISHES WHERE NEW FINISHES ARE SCHEDULED, AND PREPARE FLOOR TO RECEIVE NEW FINISHES, LEVELING FLOOR AS REQ'D, TYPICAL. FLOOR SHALL BE LEVEL SUCH THAT EXISTING FLOOR DEFECTS DO NOT TELEGRAPH THROUGH NEW FLOOR FINISH. FLOOR PREPARATION IS SUBJECT TO ARCHITECT'S APPROVAL PRIOR TO INSTALLATION.

LEGEND:

PARTITIONS ARE INDICATED ON THE PLAN THUSLY

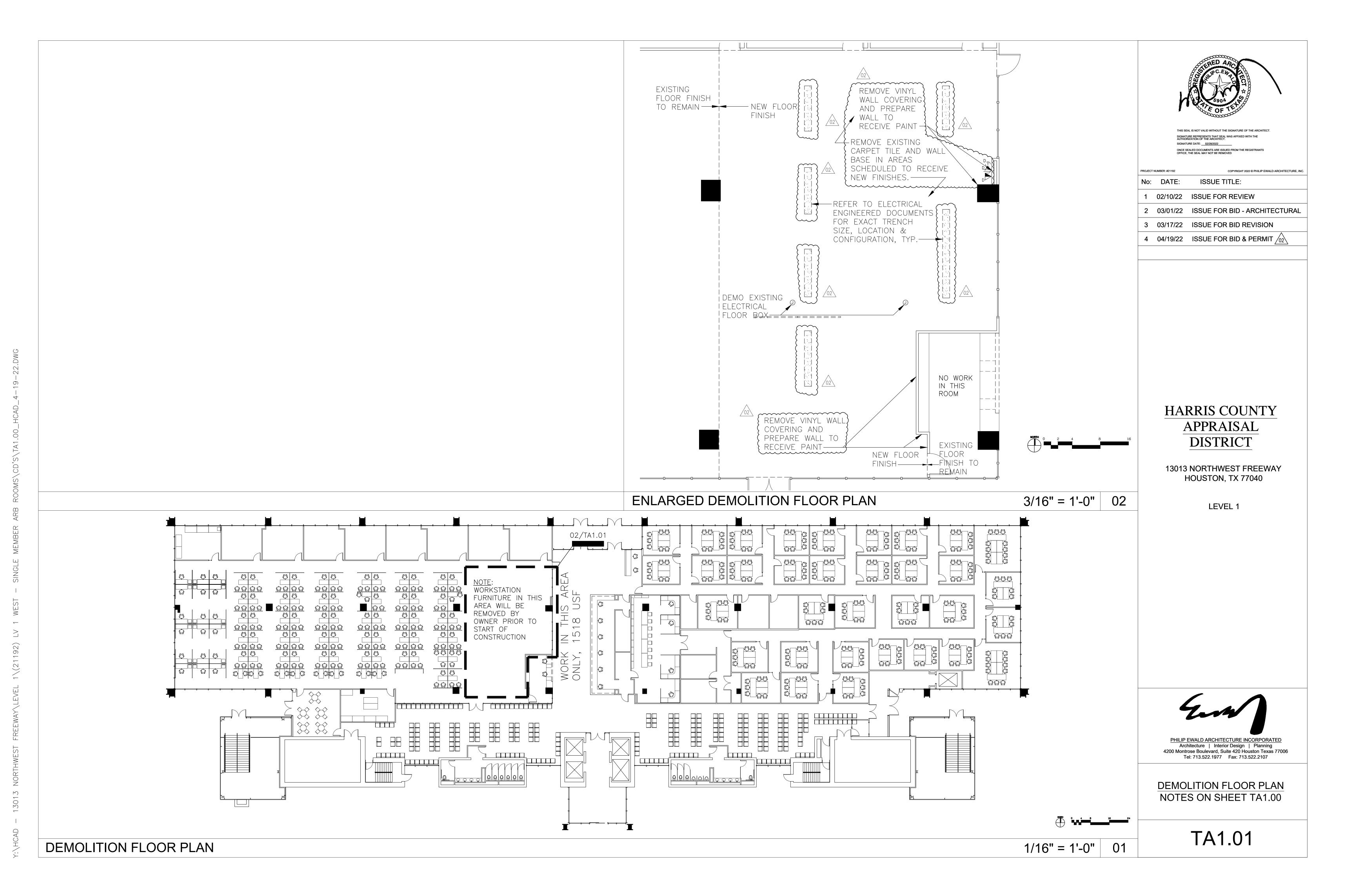
EXISTING PARTITION TO REMAIN === EXISTING PARTITION TO BE REMOVED

PHILIP EWALD ARCHITECTURE INCORPORATED Architecture | Interior Design | Planning 4200 Montrose Boulevard, Suite 420 Houston Texas 77006 Tel: 713.522.1977 Fax: 713.522.2107

PROJECT NOTES

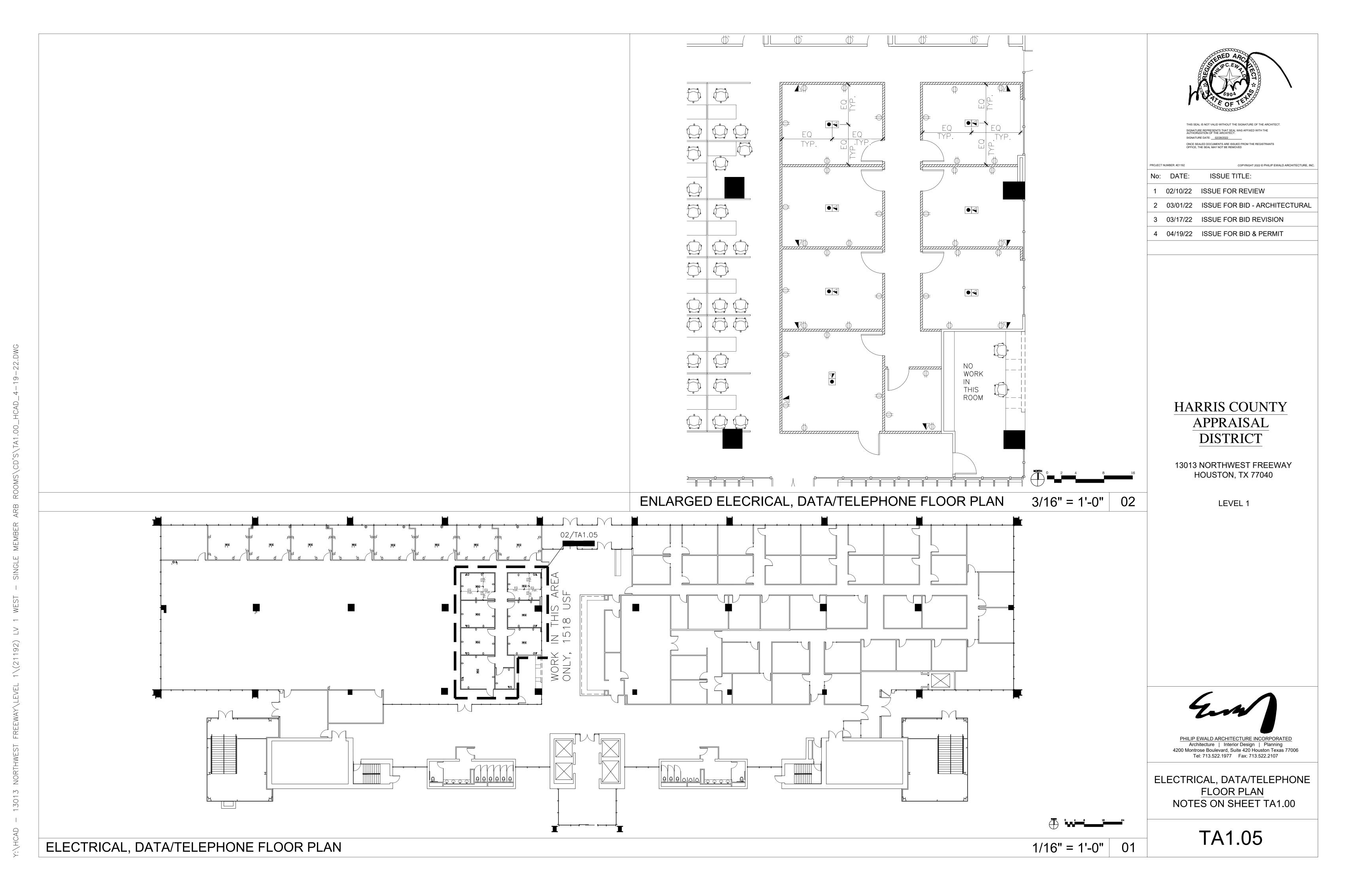
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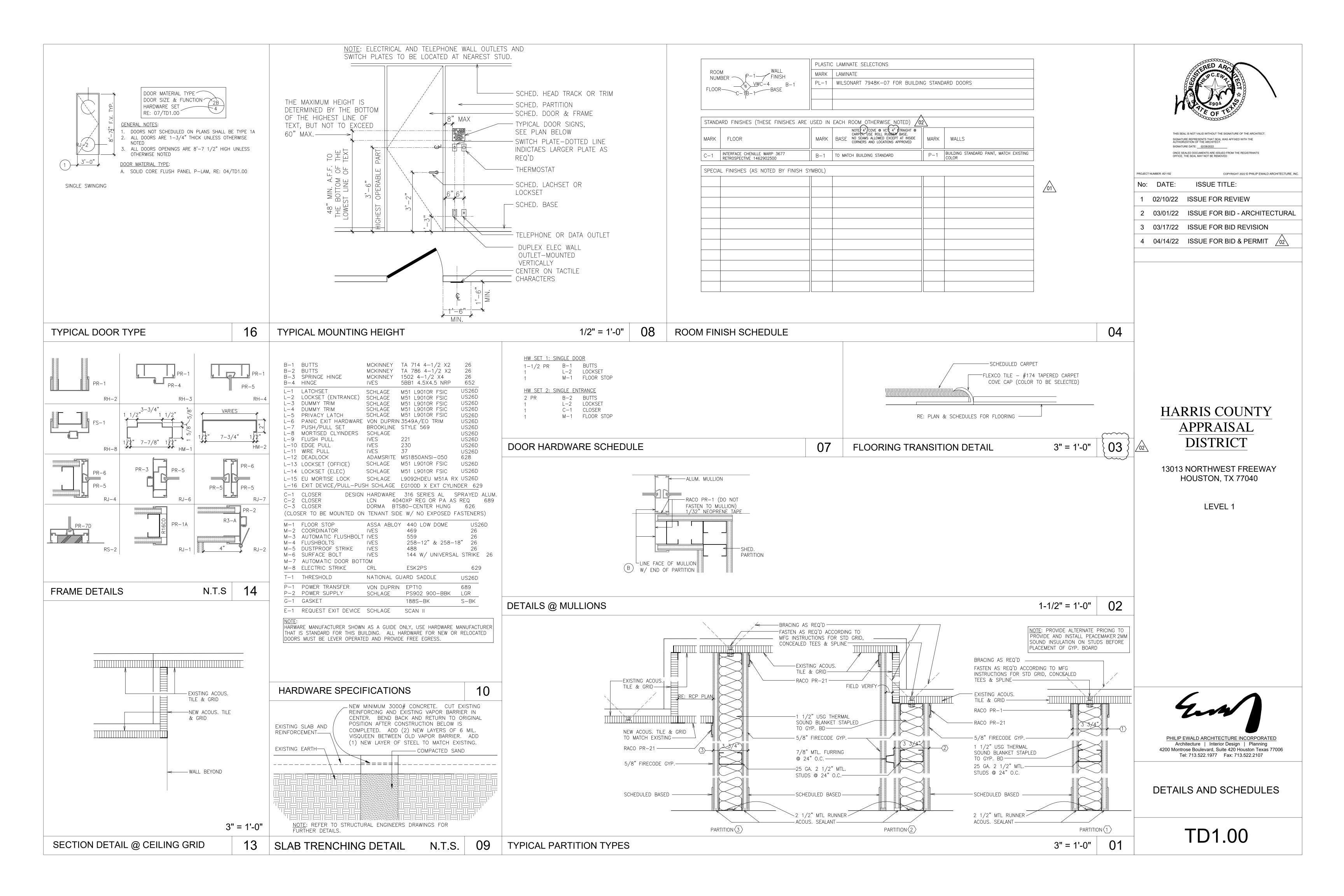
GENERAL NOTES DEMOLITION NOTES NOT USED



1\(21192) LV CAD

+ EXISTING CEILING + 8'-9" A.F.F.





	EXISTING 5" SLAB —		#3 ASTM A615 GR 60 CONT, @ 12" O.C. LAP 19" AS REQUIRED. STOP REINF @ CONTROL JOINT IN SLAB
	#3 ASTM A615 GR 60 @ 12" EMBED 3" INTO EXISTING S MID-DEPTH USING EPOXY	SLAB AT	REPAIR MOISTURE BARRIER PER ARCHITECT'S DETAILS RECOMPACT SUBGRADE
			AFTER TRENCHING
	CHLORIDES 2. INSTALL CO LATEST ADI 3. WET CURE 4. PROVIDE TO JOINTS IN A 5. REFER TO A	NCRETE AND REINFORCING PER A	CI STANDARDS TO CONCRETE. EXISTING CONTROL
	SLAB 3/4" = 1'-0"	INFILL DETAI	L AT TRENCH
1			OF TE
			DOUGLAS ANTWILER 113891

 $\label{thm:lines} $$ \c \end{times} Active Projects \end{times} $$ \c \end{times} $$\c \end{times} $$\c \end{times} $$\c \end{times} $$\c \end{times} $$\c$

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GENERAL MEP NOTES

EACH CONTRACTOR SHALL COORDINATE ITS CONSTRUCTION OPERATIONS WITH THOSE OF OTHER CONTRACTORS AND ENTITIES TO ENSURE EFFICIENT AND ORDERLY INSTALLATION OF EACH PART OF THE WORK. EACH CONTRACTOR SHALL COORDINATE ITS OPERATIONS WITH OPERATIONS, INCLUDED IN DIFFERENT SECTIONS, THAT DEPEND ON EACH OTHER FOR PROPER INSTALLATION, CONNECTION,

- 1. SCHEDULE CONSTRUCTION OPERATIONS IN SEQUENCE REQUIRED TO OBTAIN THE BEST RESULTS WHERE INSTALLATION OF ONE PART OF THE WORK DEPENDS ON INSTALLATION OF OTHER COMPONENTS, BEFORE OR AFTER ITS OWN INSTALLATION.
- 2. COORDINATE INSTALLATION OF DIFFERENT COMPONENTS WITH OTHER CONTRACTORS TO ENSURE MAXIMUM PERFORMANCE AND ACCESSIBILITY FOR REQUIRED MAINTENANCE, SERVICE,
- 3. MAKE ADEQUATE PROVISIONS TO ACCOMMODATE ITEMS SCHEDULED FOR LATER INSTALLATION. 4. VISIT THE SITE PRIOR TO SUBMITTING A BID TO VERIFY THE EXISTING CONDITIONS AND DESIGN CONSTRAINTS. FAILURE TO MEET THIS REQUIREMENT SHALL NOT BE JUSTIFICATION FOR
- FAULTY INSTALLATION OR ADDITIONAL COSTS. 5. SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR WORK, AND PAY ALL FEES FOR REQUIRED WORK.
- 6. COMPLY WITH ALL CURRENT LAWS, BUILDING CODES AND REGULATIONS FEDERAL, STATE AND LOCAL AUTHORITIES HAVING JURISDICTION. IN THE EVENT OF CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND THE LOCAL AUTHORITY HAVING JURISDICTION, THE LATTER SHALL RULE. ANY CHANGES RESULTING SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER OR ARCHITECT/ENGINEER. THE CONTRACTOR SHALL REPORT ANY SUCH MODIFICATIONS TO THE ARCHITECT/ENGINEER AND SECURE HIS APPROVAL BEFORE PROCEEDING. SHOULD THE REQUIREMENTS OF THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THE CODES HE CONTRACT DOCUMENTS SHALL GOVERN, PROVIDED THOSE REQUIREMENTS ARE NOT IN CONFLICT WITH THOSE CODES. ALL ITEMS OF EQUIPMENT AND ALL MATERIALS FOR WHICH APPROVAL STANDARDS HAVE BEEN ESTABLISHED BY UNDERWRITERS' LABORATORIES, INC. (UL), FACTORY MUTUAL (FM), AMERICAN STANDARD CODES, ASME, AGA, AMCA, ASA, ANSI, ASHRAE, AND ARI SHALL BE SÓ APPROVED AND SHALL BEAR APPROVAL LABELS.
- 7. PENETRATIONS OF WALLS AND FLOORS OF FIRE-RATED ASSEMBLIES SHALL COMPLY WITH ASTM, U.L., AND THE AUTHORITIES HAVING JURISDICTION.
- 8. IF THE DRAWINGS AND SPECIFICATIONS ARE IN CONFLICT THE GREATER AMOUNT OF WORK SHALL BE PRICED. BRING THE CONFLICT TO THE ATTENTION OF THE ENGINEER AND REQUEST
- 9. DRAWINGS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO SHOW ALL FITTINGS, COMPONENTS AND OFFSETS, ETC. THE CONTRACTOR SHALL PROVIDE ALL FITTINGS, COMPONENTS, OFFSET OR OTHER FEATURES REQUIRED FOR THE FULL OPERATIONAL CONDITION OF THIS PROJECT.
- 10. CONFIRM DIMENSIONS AND LOCATIONS IN THE FIELD. DRAWINGS ARE NOT TO BE SCALED AND ARE NOT INTENDED TO SHOW EXACT LOCATIONS BASED ON SCALING DIMENSIONS.
- 11. GUARANTEE LABOR AND MATERIALS OF ENTIRE INSTALLATION FOR ONE YEAR. WORK BELOW FLOOR OR OVER CORRIDORS SHALL BE PERFORMED AT THE OWNER'S CONVENIENCE AND MAY BE REQUIRED TO BE DONE DURING EVENINGS AND WEEKENDS, DEMOLITION DAMAGE TO EXISTING MATERIALS/EQUIPMENT WILL BE REPAIRED AT NO ADDITIONAL COST TO OWNER RE-SUPPORT ANY REMAINING PIPING OR DEVICES THAT WERE SUPPORTED BY WALLS BEING
- 12. ELECTRONIC COPIES OF CAD DRAWINGS OF THE CONTRACT DRAWINGS WILL NOT BE PROVIDED BY THE ENGINEER FOR CONTRACTOR'S USE IN PREPARING SUBMITTALS OR AS-BUILT

ACOUSTIC TREATMENT

- A. IT IS THE INTENT OF THESE DRAWINGS TO SPECIFY AND FOR THE CONTRACTOR TO INSTALL SYSTEMS THAT ARE QUIET AND FREE OF VIBRATION. EQUIPMENT SHALL BE BALANCED AND VIBRATION ISOLATED TO MEET THE REQUIREMENTS SPECIFIED HEREIN FOR BOTH THE FOUIPMENT ITSELF AND CONDITIONS WITHIN OCCUPIED SPACES. THIS CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND INSTALLING EQUIPMENT THAT IS QUIET IN OPERATION AS COMPARED TO OTHER AVAILABLE EQUIPMENT OF ITS SIZE, CAPACITY, AND TYPE
- B. EQUIPMENT NOT MEETING THESE REQUIREMENTS SHALL BE CORRECTED BY THE CONTRACTOR AN ACCEPTABLE LEVEL BUT WITHIN THE REQUIREMENTS OF THE SPECIFICATIONS AT NO COST TO THE OWNER, ARCHITECT OR ENGINEER.
- AIR DISTRIBUTION EQUIPMENT SHALL BE SOUND TESTED AT THE DESIGN OPERATING CONDITIONS AND SHALL NOT EXCEED A MAXIMUM DISCHARGE NC RATING OF 25 OR A RADIATED NC RATING OF 30 AT RATED CFM.
- UNLESS NOTED OTHERWISE HEREIN OR ON THE DRAWINGS, THE NOISE LEVEL IN ALL OCCUPIED SPACES SHALL NOT EXCEED THE "LOWEST VALUE IN THE RANGE" OF THE NOISE CRITERIA CURVES PUBLISHED IN THE CURRENT FUNDAMENTALS EDITION OF THE ASHRAF GUIDE AND DATA BOOK. THE NOISE CRITERIA CURVES SHALL BE BASED ON ANSI STANDARD S1.6-1967 OCTAVE BANDS AND A SOUND PRESSURE LEVEL IN DECIBELS REFERENCED TO 0.002 MICROBARS. SOUND LEVELS IN OCCUPIED SPACES MUST MEET THE DESIGN CRITERIA WITH
- SHOULD A QUESTION ARISE REGARDING THE ACCEPTABLE LEVEL OF NOISE OR VIBRATION IN A PARTICULAR SPACE OR PIECE OF EQUIPMENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE SERVICES OF AN APPROVED ACOUSTICAL CONSULTANT TO DETERMINE ACTUAL

SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. FLECTRONIC COPIES OF CAD DRAWINGS OF THE CONTRACT DRAWINGS WILL NOT BE PROVIDED. BY THE ENGINEER FOR CONTRACTOR'S USE IN PREPARING SUBMITTALS OR AS-BUILT DRAWINGS.
- B. COORDINATE PREPARATION AND PROCESSING OF SUBMITTALS WITH PERFORMANCE OF CONSTRUCTION ACTIVITIES. COORDINATE EACH SUBMITTAL WITH FABRICATION, PURCHASING, TESTING, DELIVERY, OTHER SUBMITTALS, AND RELATED ACTIVITIES THAT REQUIRE SEQUENTIAL ACTIVITY, SUBMIT ALL ITEMS REQUIRED FOR EACH SPECIFICATION SECTION CONCURRENTLY C. ALLOW TIME FOR SUBMITTAL REVIEW. INCLUDING TIME FOR RESUBMITTALS. AS FOLLOWS. TIME
- FOR REVIEW SHALL COMMENCE ON ENGINEER'S RECEIPT OF SUBMITTAL. NO EXTENSION OF THE CONTRACT TIME WILL BE AUTHORIZED BECAUSE OF FAILURE TO TRANSMIT SUBMITTALS ENOUGH IN ADVANCE OF THE WORK TO PERMIT PROCESSING, INCLUDING RESUBMITTALS. 1. INITIAL REVIEW: ALLOW 7 DAYS FOR INITIAL REVIEW OF EACH SUBMITTAL EXCLUSIVE OF
- TRAVEL TIME. ALLOW ADDITIONAL TIME IF COORDINATION WITH SUBSEQUENT SUBMITTALS IS

2. RESUBMITTAL REVIEW: ALLOW 7 DAYS FOR REVIEW OF EACH RESUBMITTAL EXCLUSIVE OF

- D. PLACE A PERMANENT LABEL OR TITLE BLOCK ON EACH PAPER COPY SUBMITTAL ITEM FOR IDENTIFICATION. INDICATE NAME OF FIRM OR ENTITY THAT PREPARED EACH SUBMITTAL ON
- E. INCLUDE THE FOLLOWING INFORMATION FOR PROCESSING AND RECORDING ACTION TAKEN:
- PROJECT NAME. NAME OF ARCHITECT. NAME OF ENGINEER. NAME OF CONTRACTOR NAME OF SUBCONTRACTOR

NAME OF SUPPLIER.

8. NAME OF MANUFACTURER.

- REVIEW EACH SUBMITTAL AND CHECK FOR COORDINATION WITH OTHER WORK OF THE CONTRACT AND FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS. NOTE CORRECTIONS AND FIELD DIMENSIONS. MARK WITH APPROVAL STAMP BEFORE SUBMITTING TO ARCHITECT/ENGINEER. STAMP EACH SUBMITTAL WITH A UNIFORM, APPROVAL STAMP. PROVIDE A STATEMENT CERTIFYING THAT SUBMITTAL HAS BEEN REVIEWED. CHECKED. AND APPROVED FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND THE PHYSICAL SPACE LIMITATIONS AT THE PROVIDE A STATEMENT CERTIFYING THAT SUBMITTAL HAS BEEN REVIEWED, CHECKED, AND APPROVED FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND THE PHYSICAL SPACE LIMITATIONS AT THE SITE.
- IF THE GENERAL CONTRACTOR IS DEFERRING THE ABOVE REQUIREMENTS TO THE SUBCONTRACTOR. THEN THE SUBCONTRACTOR MUST ALSO REVIEW, STAMP AND CERTIFY THE
- ENGINEER WILL NOT REVIEW SUBMITTALS THAT DO NOT BEAR CONTRACTOR'S APPROVAL STAMP AND WILL RETURN THEM. ENGINEER WILL REVIEW EACH SUBMITTAL, NOTE CORRECTIONS OR MODIFICATIONS REQUIRED, AND RETURN IT. ENGINEER WILL PROVIDE SUBMITTAL WITH AN ACTION SHEET TO INDICATE

REQUESTS FOR INFORMATION (RFI)

IMMEDIATELY ON DISCOVERY OF THE NEED FOR ADDITIONAL INFORMATION OR INTERPRETATION OF THE CONTRACT DOCUMENTS, CONTRACTOR SHALL PREPARE AND SUBMIT AN RFI IN THE FORM

- ENGINEER WILL RETURN RFIS SUBMITTED TO ENGINEER BY OTHER ENTITIES CONTROLLED BY CONTRACTOR WITH NO RESPONSE.
- . COORDINATE AND SUBMIT RFIS IN A PROMPT MANNER SO AS TO AVOID DELAYS IN CONTRACTOR'S WORK OR WORK OF SUBCONTRACTORS.
- 3. INCLUDE A PROPOSED SOLUTION AS WELL AS INCLUDE A DETAILED, LEGIBLE DESCRIPTION OF ITEM NEEDING INFORMATION OR INTERPRETATION. INCLUDE SKETCHES, DESCRIPTIONS, MEASUREMENTS, PHOTOS, PRODUCT DATA, SHOP DRAWINGS, COORDINATION DRAWINGS, AND OTHER INFORMATION NECESSARY TO FULLY DESCRIBE ITEMS NEEDING INTERPRETATION.
- A. WITHIN 90 DAYS OF COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER. A COMPLETE SET OF "AS BUILT" DRAWINGS PORTRAYING ACTUAL SITE CONDITIONS
- OF THE MECHANICAL FLECTRICAL PLUMBING AND FIRE PROTECTION WORK, SUBMISSION SHALL CONSIST OF ONE SET OF PAPER SEPIAS AND ONE SET OF CAD FILES IN AUTOCAD 2007 FORMAT. ENGINEER AND ARCHITECT SEALS AND LOGOS SHALL BE REMOVED FROM THE DRAWINGS AND THEY SHALL BE STAMPED "AS-BUILT DRAWINGS" B. WITHIN 90 DAYS OF COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT TO THE
- ENGINEER, A COMPLETE SET OF "O&M MANUALS", EQUIPMENT DATA, HVAC AIR AND WATER BALANCING REPORT. AND LIGHTING CONTROL TESTING REPORT FOR COMPLIANCE WITH CURREN ENERGY CODE. THE CONTRACTOR SHALL PROVIDE A WRITTEN CERTIFICATION THAT ALL NEW MATERIALS AND COMPONENTS DO NOT CONTAIN ASBESTOS OR PCBS.

REQUIRED SUBMITTALS

- PROVIDE FOUR BOUND PRODUCT DATA SUBMITTALS FOR THE NEW EQUIPMENT LISTED BELOW TO THE ARCHITECT/ENGINEER. EACH CONTRACTOR RESPONSIBLE FOR THE WORK SHALL REVIEW AND CERTIFY THE SUBMITTAL DATA TO BE IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS AND THE PHYSICAL SPACE LIMITATIONS. AIR HANDLING UNITS
 - FAN COIL UNITS AIR DISTRIBUTION DEVICES ELECTRICAL TRANSFORMERS LIGHTING FIXTURES
 - WIRING DEVICES PLUMBING FIXTURES AIR AND WATER BALANCE REPORTS CIRCUIT DIRECTORY CARDS

MECHANICAL AND SERVICE WATER HEATING COMMISSIONING

- ALL REQUIREMENTS SHALL BE PERFORMED PER THE CURRENTLY ADOPTED ENERGY CONSERVATION CODE IN THE AUTHORITY HAVING JURISDICTION. THE FOLLOWING IS NOT A COMPLETE LISTING.
- SYSTEMS ADJUSTING AND BALANCING: HVAC SYSTEMS SHALL BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS. AIR AND WATER FLOW RATES SHALL BE MEASURED AND ADJUSTED TO DELIVER FINAL FLOW RATES WITHIN TOLERANCES PROVIDED IN THE PRODUCT SPECIFICATIONS. TEST AND BALANCE ACTIVITIES SHALL INCLUDE AIR SYSTEM AND HYDRONIC SYSTEM BALANCING. THE FOLLOWING SYSTEMS ARE EXEMPT:
 - MECHANICAL SYSTEMS AND SERVICE WATER HEATER SYSTEMS IN BUILDINGS WHERE THE TOTAL MECHANICAL EQUIPMENT CAPACITY IS LESS THAN 480,000 BTUH COOLING CAPACITY AND 600,000 BTUH COMBINED SERVICE WATER HEATING AND SPACE HEATING CAPACITY. SYSTEMS THAT SERVE INDIVIDUAL DWELLING UNITS AND SLEEPING UNITS.
- AIR SYSTEMS BALANCING: EACH SUPPLY AIR OUTLET AND ZONE TERMINAL DEVICE SHALL B EQUIPPED WITH MEANS FOR AIR BALANCING. DISCHARGE DAMPERS USED FOR AIR SYSTEM BALANCING ARE PROHIBITED ON CONSTANT VOLUME FANS AND VARIABLE VOLUME FANS WITH MOTORS 10HP AND LARGER. AIR SYSTEMS SHALL BE BALANCED IN A MANNER TO FIF MINIMIZE THROTTLING LOSSES THEN FOR FANS WITH SYSTEM POWER OF GREATER THAT 1 HP FAN SPEED SHALL BE ADJUSTED TO MEET DESIGN FLOW CONDITIONS. EXCEPTIONS: FANS WITH MOTORS OF 1 HP OR LESS ARE NOTE REQUIRED TO BE PROVIDED WITH A MEANS FOR AIR
- EQUIPPED WITH A MEANS FOR BALANCING AND MEASURING FLOW. HYDRONIC SYSTEMS SHALI E PROPORTIONATELY BALANCED IN A MANNER TO FIRST MINIMIZE THROTTLING LOSSES. THE HE PUMP IMPELLER SHALL BE TRIMMED OR PUMP SPEED SHALL BE ADJUSTED TO MEET DESIGN FLOW CONDITIONS. EACH HYDRONIC SYSTEM SHALL HAVE EITHER THE CAPABILITY TO MEASURE PRESSURE ACROSS THE PUMP. OR TEST PORTS AT EACH SIDE OF EACH PUMP. THE FOLLOWING EQUIPMENT IS NOT REQUIRED TO BE EQUIPPED WITH A MEANS FOR BALANCING OR
 - PUMPS WITH PUMP MOTORS OF 5 HP (3.7 KW) OR LESS, WHERE THROTTLING RESULTS IN NO GREATER THAN 5 PERCENT OF THE NAMEPLATE HORSEPOWER DRAW ABOVE THAT REQUIRED IF THE IMPELLER WERE

HYDRONIC SYSTEM BALANCING: INDIVIDUAL HYDRONIC HEATING AND COOLING COILS SHALL BE

- FUNCTIONAL PERFORMANCE TESTING. FUNCTIONAL PERFORMANCE TESTING SHALL BE FOUIPMENT, FOUIPMENT FUNCTIONAL PERFORMANCE TESTING SHALL DEMONSTRAT THE INSTALLATION AND OPERATION OF COMPONENTS, SYSTEMS, AND
- SYSTEM-TO-SYSTEM INTERFACING RELATIONSHIPS IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS SUCH THAT OPERATION, FUNCTION, AND MAINTENANCE SERVICEABILITY FOR EACH OF THE COMMISSIONED SYSTEMS IS CONFIRMED. TESTING SHALL INCLUDE ALL MODES AND SEQUENCE OF OPERATION, INCLUDING UNDER FULL-LOAD, PART-LOAD AND THE FOLLOWING EMERGENCY
- ALL MODES AS DESCRIBED IN THE SEQUENCE OF OPERATION. REDUNDANT OR AUTOMATIC BACK-UP MODE. PERFORMANCE OF ALARMS.

 MODE OF OPERATION UPON A LOSS OF POWER AND RESTORATION OF POWER.

A. ALL REQUIREMENTS SHALL BE PERFORMED PER THE CURRENTLY ADOPTED ENERGY

ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.

O BE TESTED, VERIFY THE FOLLOWING

VERIFY CORRECT OPERATION.

WITHIN THE REQUIRED TIME.

ONLY WHEN MANUALLY ACTIVATED.

WEEKDAY, WEEKEND AND HOLIDAY SCHEDULES.

AND PREFERENCE PROGRAM SETTINGS

CONTROL SWITCH.

THE FOLLOWING SHALL BE VERIFIED:

HE SWITCH IS LOCATED.

RESPONSE TO AVAILABLE DAYLIGHT.

ACCESSIBLE ONLY TO AUTHORIZED PERSONNE

NONEXEMPT LIGHTING TURNS OFF.

ADJACENT AREAS OR BY HVAC OPERATION.

VERIFY THE CORRECT TIME AND DATE IN THE TIME SWITCH.

TIME-SWITCH CONTROLS. WHERE TIME-SWITCH CONTROLS ARE PROVIDED, THE FOLLOWING

PROCEDURES SHALL BE PERFORMED:
1. CONFIRM THAT THE TIME-SWITCH CONTROL IS PROGRAMMED WITH ACCURATE

PROVIDE DOCUMENTATION TO THE OWNER OF TIMESWITCH CONTROLS

COMPLETE LISTING.

ONSERVATION CODE IN THE AUTHORITY HAVING JURISDICTION. THE FOLLOWING IS NOT A

FOR PROJECTS WITH SEVEN OR FEWER OCCUPANT SENSORS, EACH SENSOR SHALL

FOR PROJECTS WITH MORE THAN SEVEN OCCUPANT SENSORS, TESTING SHALL BE

DONE FOR EACH UNIQUE COMBINATION OF SENSOR TYPE AND SPACE GEOMETRY

WHERE MULTIPLES OF EACH UNIQUE COMBINATION OF SENSOR TYPE AND SPACE GEOMETRY ARE PROVIDED, NOT LESS THAN 10 PERCENT, BUT IN NO CASE LESS

OR DESIGN PROFESSIONAL REQUIRES A HIGHER PERCENTAGE TO BE TESTED. WHERE 30 PERCENT OR MORE OF THE TESTED CONTROLS FAIL, ALL REMAINING

3.1. WHERE OCCUPANT SENSOR CONTROLS INCLUDE STATUS INDICATORS,

IDENTICAL COMBINATIONS SHALL BE TESTED. FOR OCCUPANT SENSOR CONTROLS

3.2. THE CONTROLLED LIGHTS TURN OFF OR DOWN TO THE PERMITTED LEVEL

3.3. FOR AUTO-ON OCCUPANT SENSOR CONTROLS, THE LIGHTS TURN ON TO

THE PERMITTED LEVEL WHEN AN OCCUPANT ENTERS THE SPACE.

3.4. FOR MANUAL-ON OCCUPANT SENSOR CONTROLS, THE LIGHTS TURN ON

PROGRAMMING INCLUDING WEEKDAY, WEEKEND, HOLIDAY SCHEDULES, AND SET-UP

VERIFY THAT ANY BATTERY BACK-UP IS INSTALLED AND ENERGIZED. VERIFY THAT THE OVERRIDE TIME LIMIT IS SET TO NOT MORE THAN 2 HOURS.

6.1. ALL LIGHTS CAN BE TURNED ON AND OFF BY THEIR RESPECTIVE AREA

6.2. THE SWITCH ONLY OPERATES LIGHTING IN THE ENCLOSED SPACE IN WHICH

MANUAL OVERRIDE SWITCH ALLOWS ONLY THE LIGHTS IN THE ENCLOSED

SPACE WHERE THE OVERRIDE SWITCH IS LOCATED TO TURN ON OR REMAIN

SIMULATE OCCUPIED CONDITION. VERIFY AND DOCUMENT THE FOLLOWING

SIMULATE UNOCCUPIED CONDITION. VERIFY AND DOCUMENT THE FOLLOWING:

ADDITIONAL TESTING AS SPECIFIED BY THE REGISTERED DESIGN PROFESSIONAL

CONTROL DEVICES HAVE BEEN PROPERLY LOCATED, FIELD CALIBRATED AND SET FOR ACCURATE SETPOINTS AND THRESHOLD LIGHT LEVELS.
DAYLIGHT CONTROLLED LIGHTING LOADS ADJUST TO LIGHT LEVEL SET POINTS IN

ON UNTIL THE NEXT SCHEDULED SHUTOFF OCCURS.

DAYLIGHT RESPONSIVE CONTROLS. WHERE DAYLIGHT RESPONSIVE CONTROLS ARE PROVIDED,

THE LOCATIONS OF CALIBRATION ADJUSTMENT EQUIPMENT ARE READILY

3.5. THE LIGHTS ARE NOT INCORRECTLY TURNED ON BY MOVEMENT IN

THAN ONE, OF EACH COMBINATION SHALL BE TESTED UNLESS THE CODE OFFICIAL

- FLEXIBLE DUCT. A MINIMUM OF 1" OF SLACK SHALL BE ALLOWED IN ALL FLEXIBLE EXCEPTION: UNITARY OR PACKAGED HVAC EQUIPMENT THAT DO NOT REQUIRE SUPPLY AIR CONNECTIONS TO INSURE VIBRATION ISOLATION. FLEXIBLE FABRIC SHALL BE A MINIMUM OF 3 INCHES WIDE WITH "GRIP-LOC" SEAM TO 24 GAUGE GALVANIZED METAL SIDE CONNECTORS A MINIMUM OF 3 INCHES WIDE EACH. FLEXIBLE CONNECTION ARE TO FABRICATED WITH ELGEN CONTROLS. HVAC AND SERVICE WATER-HEATING CONTROL SYSTEMS SHALL BE TESTED TO "ZIPPERLOCK" #ZLN-4 NEOPRENE COATED 30 OZ. FIBERGLASS WITH 24 GAUGE GALVANIZED DOCUMENT THAT CONTROL DEVICES. COMPONENTS, EQUIPMENT AND SYSTEMS ARE CALIBRATED IRON SIDE CONNECTORS, OR DURO DYNE EXCELON "METAL-FAB" VINYL COATED 22 OZ. NYLON AND ADJUSTED AND OPERATE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS. WITH 24 GAUGE GALVANIZED IRON SIDE CONNECTORS OR "APPROVED EQUAL". SEQUENCES OF OPERATION SHALL BE FUNCTIONALLY TESTED TO DOCUMENT THEY OPERATE IN
- ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS. M. INSTALL MANUAL SPLITTER DAMPERS IN BRANCH TAKE-OFFS WHERE SHOWN. SPLITTER DAMPERS SHALL BE MINIMUM 16 GAUGE GALVANIZED SHEET METAL AND SHALL BE 3/4 OF ECONOMIZERS. AIR ECONOMIZERS SHALL UNDERGO A FUNCTIONAL TEST TO DETERMINE THAT THE WIDTH OF THE SMALLEST TAKE-OFF BUT NO LESS THAN 6" LONG. DAMPERS SHALL THEY OPERATE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. HAVE 1/8" OF CLEARANCE TO THE DUCT IN WHICH THEY ARE INSTALLED. SPLITTER DAMPERS SHALL BE CONTROLLED BY ONE OR MORE CONTROL RODS IN ACCORDANCE WITH FIG. 2-5 OF LIGHTING SYSTEM FUNCTIONAL TESTING HE SMACNA MANUAL. WHERE SPLITTERS ARE IN CONCEALED INACCESSIBLE LOCATIONS,
 - N. DUCTWORK WHICH IS EXPOSED TO WEATHER SHALL HAVE SOLDERED JOINTS AND SEAMS AND SHALL BE PAINTED WITH A SUITABLE EPOXY COATING.

SUBMIT PROPOSED CONTROL ROD DETAILS FOR APPROVAL

OCCUPANT SENSOR CONTROLS. WHERE OCCUPANT SENSOR CONTROLS ARE PROVIDED, THE FOLLOWING PROCEDURES SHALL BE PERFORMED: 1. CERTIFY THAT THE OCCUPANT SENSOR HAS BEEN LOCATED AND AIMED IN HVAC FILTRATION AND AIR QUALITY

- UNO, EACH NEW EQUIPMENT SHALL BE PROVIDED WITH A PRE-FILTER WITH A MINIMUM FILTRATION OF MERV-11. FILTER EFFICIENCY SHALL BE RATED IN ACCORDANCE WITH ASHRAE 52-76. AIRFLOW SHALL NOT BE GREATER THAN 500 FPM.
- UNO, EACH NEW EQUIPMENT SHALL BE PROVIDED WITH A BI-POLAR IONIZATION DEVICE(S) THAT MUST MEET UL-2998 STANDARD CERTIFICATION (ENVIRONMENTAL CLAIM VALIDATION PROCEDURE (ECVP) FOR ZERO OZONE EMISSIONS FOR AIR CLEANERS). THE DEVICE(S) SHALL BE MOUNTED IN THE DOWN STREAM SUPPLY DUCTWORK OR INSIDE THE EQUIPMENT. UNO, THE POWER TO THE DEVICE(S) SHALL BE COMING FROM THE EQUIPMENT'S POWER SOURCE AND INTERLOCKED WITH THE EQUIPMENT'S OPERATION. THE NUMBER OF THE DEVICES SHALL BE SELECTED AND DESIGNED PER THE MANUFACTURER GUIDELINES TO MEET THE DESIGN AIR FLOW CAPACITY REQUIREMENT AND AREA OF COIL FACE COVERAGE.

FLEXIBLE DUCTWORK

MECHANICAL SPECIFICATIONS

GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION

B. TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC

DUCT CONSTRUCTION STANDARDS — METAL AND FLEXIBLE." FIGURE 2-1. "RECTANGULAR

DUCT/TRANSVERSE JOINTS " FOR STATIC-PRESSURE CLASS APPLICABLE SEALING

SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS — METAL AND FLEXIBLE."

STANDARDS - METAL AND FLEXIBLE" BASED ON REQUIRED STATIC-PRESSURE CLASS UNLESS

REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN

LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC

REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN

DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-2, "RECTANGULAR

ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND OTHER DUCT CONSTRUCTION:

STANDARDS — METAL AND FLEXIBLE," CHAPTER 4, "FITTINGS AND OTHER CONSTRUCTION,

FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED,

DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION

GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION

STANDARDS — METAL AND FLEXIBLE," CHAPTER 3, "ROUND, OVAL, AND FLEXIBLE DUCT,"

B. FLAT-OVAL DUCTS: INDICATED DIMENSIONS ARE THE DUCT WIDTH (MAJOR DIMENSION) AND

DIAMETER OF THE ROUND SIDES CONNECTING THE FLAT PORTIONS OF THE DUCT (MINOR

DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-1, "ROUND DUCT

TRANSVERSE JOINTS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS,

MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S

D. LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC

DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-2, "ROUND DUCT

LONGITUDINAL SEAMS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS

MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S

E. TEES AND LATERALS: SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT

SEALING REQUIREMENTS. MATERIALS INVOLVED. DUCT-SUPPORT INTERVALS. AND OTHER

GENERAL MATERIAL REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION

STANDARDS - METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESSES,

AND DUCT CONSTRUCTION METHODS UNLESS OTHERWISE INDICATED. SHEET METAL MATERIALS

SHALL BE FREE OF PITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATIONS, AND

SUPPLY AND RETURN DUCTWORK SHALL BE EXTERNALLY INSULATED WITH EXTERNAL BLANKET

INSULATION. DUCTWORK SHALL BE INTERNALLY LINED ONLY WHERE SPECIFICALLY INDICATED.

DUCTWORK SHALL BE SEALED AS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION AND

AS REQUIRED TO LIMIT LEAKAGE. LEAKAGE IN EXCESS OF 5% SHALL NOT BE ACCEPTABLE.

THE INTERIOR SURFACE OF ALL DUCTWORK SHALL BE SMOOTH WITH NO SHEETMETAL OR

OTHER PARTS PROJECTING INTO THE AIR STREAM. ALL SEAMS AND JOINTS SHALL BE

OPERATED TO REMOVE ANY DEBRIS PRIOR TO CONNECTION OF AIR DISTRIBUTION DEVICES.

INSTALL ALL DUCTWORK TIGHT TO STRUCTURE UNLESS OTHERWISE NOTED. THE MECHANICAL

CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES PRIOR TO THE CONSTRUCTION OR

ALL TRANSVERSE JOINTS SHALL BE SEALED WITH A WATER BASE ADHESIVE SEALER DESIGNED

FOR USE IN MEDIUM VELOCITY DUCT SYSTEMS. SEALER SHALL BE EFFECTIVE AGAINST BOTH

NEGATIVE AND POSITIVE PRESSURE LOSSES. SEALER SHALL HAVE A FLAME SPREAD RATING

OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS. APPLY UN-THINNED

WITH BRUSH, TROWEL OR CAULKING GUN AS PER THE MANUFACTURER'S RECOMMENDATIONS

AND ALLOW TO DRY FOR A MINIMUM OF 48 HOURS BEFORE AIR IS APPLIED TO THE SYSTEM.

HARDCAST, INC., UNI-GRIP AS MANUFACTURED BY UNITED MCGILL, OR AN APPROVED EQUAL

ALL ROUND TAKE-OFFS SHALL BE MADE WITH A DAMPER EXTRACTOR SPIN-IN COLLAR.

ALL DUCTWORK SUPPORTS SHALL BE PER TABLE 5-1 OF THE SMACNA MANUAL WITH ALL

SUPPORTS DIRECTLY ANCHORED TO THE BUILDING STRUCTURE. SUPPORTS SHALL BE ON

FLEXIBLE DUCT FABRIC CONNECTIONS SHALL BE INSTALLED ON THE INLET AND OUTLET

MAXIMUM 8'- 0" CENTERS WITH ADDITIONAL SUPPORTS AS REQUIRED TO PREVENT SAGGING.

CONNECTIONS TO ALL POWERED AIR MOVING EQUIPMENT WHICH IS NOT CONNECTED WITH

SPIN-INS SHALL BE INSTALLED WITH THEIR DAMPER AXIS PARALLEL TO AIR FLOW.

XTERNAL. THE INSIDE OF ALL DUCTWORK SHALL BE THOROUGHLY CLEANED AND ALL FANS

CONSTRUCTION STANDARDS — METAL AND FLEXIBLE." FIGURE 3—5. "90 DEGREE TEES AND

LATERALS," AND FIGURE 3-6. "CONICAL TEFS." FOR STATIC-PRESSURE CLASS. APPLICABLE

PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS — METAL AND FLEXIBLE."

TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC

BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.

SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION

DUCT/LONGITUDINAL SEAMS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING

SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

STANDARDS - METAL AND FLEXIBLE."

SHEET METAL DUCTWORK

SINGLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTINGS

"HVAC DUCT CONSTRUCTION STANDARDS — METAL AND FLEXIBLE.

"HVAC DUCT CONSTRUCTION STANDARDS — METAL AND FLEXIBLE."

B. GALVANIZED SHEET STEEL: COMPLY WITH ASTM A 653/A 653M.

ALL DUCTWORK DIMENSIONS ON THE DRAWINGS ARE CLEAR INSIDE

EALED CHALL DE "IDON COID WATED DACE DUCT CEALANT #601" AC

DUCT DIMENSIONS ARE INSIDE CLEAR DIMENSIONS.

INSTALLATION OF DUCTWORK

- FLEXIBLE DUCT SHALL BE USED FOR CONNECTIONS TO AIR DISTRIBUTION DEVICES WHERE SHOWN ON THE DRAWINGS OR SPECIFIED HEREIN. MAXIMUM LENGTH SHALL BE 5'-0" FOR AIR DISTRIBUTION DEVICE CONNECTIONS. WHERE LONGER RUNS ARE REQUIRED, PROVIDE RIGID
- INSULATED FLEXIBLE DUCT SHALL BE A FACTORY FABRICATED ASSEMBLY CONSISTING OF A GALVANIZED STEEL OR SPIRAL ALUMINUM HELIX. STAINLESS INNER LINER SHALL BE COMPOSED OF 3-PLY ALUMINUM FOIL OR HEAVILY COATED FIBERGLASS WITH A MAXIMUM THERMAL CONDUCTANCE OF .23 BTU/HR/SF/F. THE ASSEMBLY SHALL BE SHEATHED IN A REINFORCED METALIZED VAPOR BARRIER OUTER JACKET.
- THE FLEXIBLE DUCT ASSEMBLY SHALL BE SUITABLE FOR A MINIMUM OF 6" W.C. WORKING PRESSURE AND SHALL BE LISTED CLASS I BY THE UNDERWRITERS LABORATORY AT A FLAME SPREAD OF NOT OVER 25 AND A SMOKE DEVELOPED RATE OF NOT OVER 50. DUCTS SHALL ALSO COMPLY WITH NFPA STANDARD 90A.
- FLEXIBLE DUCTS SHALL BE SUPPORTED IN SUCH A MANNER TO PREVENT SAGS AND KINKS. BENDS IN ANY LENGTH OF FLEXIBLE DUCT SHALL NOT EXCEED 90° FOR AIR DISTRIBUTION
- ALL JOINTS AND CONNECTIONS SHALL BE MADE WITH 1/2" WIDE STAINLESS STEEL DUCT LAMPS OR 100% NYLON SELF-LOCKING CLAMPS MANUFACTURED BY PANDUIT CORPORATION OR AN APPROVED EQUAL.
- IF IT COMPLIES WITH THESE SPECIFICATIONS, FLEXIBLE DUCTWORK OF THE FOLLOWING TYPES WILL BE ACCEPTABLE: FLEXMASTER TYPE 8M OR APPROVED EQUAL (EQUIVALENT TO R6).

PROVIDE ALL TEMPERATURE CONTROLS MODIFICATIONS REQUIRED FOR A COMPLETE AND FUNCTIONING CONTROLS SYSTEM. ALL CONTROLS SHALL MATCH BUILDING STANDARD.

CHILLED WATER / CONDENSATE PIPING

FACINGS: RAISED FACE.

THREADED JOINTS.

- A. STEEL PIPE: ASTM A 53/A 53M, BLACK STEEL WITH PLAIN ENDS.
- B. CAST-IRON THREADED FITTINGS: ASME B16.4; CLASSES 125 AND 250. MALLEABLE-IRON THREADED FITTINGS: ASME B16.3, CLASSES 150 AND 300. MALLEABLE-IRON UNIONS: ASME B16.39; CLASSES 150, 250, AND 300.
- CAST-IRON PIPE FLANGES AND FLANGED FITTINGS: ASME B16.1, CLASSES 25, 125, AND 250; RAISED GROUND FACE, AND BOLT HOLES SPOT FACED.
- WROUGHT-STEEL FITTINGS: ASTM A 234/A 234M, WALL THICKNESS TO MATCH ADJOINING
- WROUGHT CAST- AND FORGED-STEEL FLANGES AND FLANGED FITTINGS: ASME B16.5, INCLUDING BOLTS, NUTS, AND GASKETS OF THE FOLLOWING MATERIAL GROUP, END CONNECTIONS. AND FACINGS: MATERIAL GROUP: 1 END CONNECTIONS: BUTT WELDING.
- GROOVED MECHANICAL-JOINT FITTINGS AND COUPLINGS: MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
- CENTRAL SPRINKLER COMPANY; A DIVISION OF TYCO FIRE & BUILDING PRODUCTS. NATIONAL FITTINGS, INC. S.P. FITTINGS; A DIVISION OF STAR PIPE PRODUCTS.
- JOINT FITTINGS: ASTM A 5.36. GRADE 65-45-12 DUCTILE IRON: ASTM A 47/A 47M. GRADE 32510 MALLEABLE IRON: ASTM A 53/A 53M. TYPE F. E. OR S. GRADE B FABRICATED STEEL; OR ASTM A 106, GRADE B STEEL FITTINGS WITH GROOVES OR SHOULDERS CONSTRUCTED TO ACCEPT GROOVED-END COUPLINGS; WITH NUTS, BOLTS, LOCKING PIN, LOCKING TOGGLE OR LLIGS TO SECURE GROOVED PIPE AND FITTINGS COUPLINGS: DUCTILE— OR MALLEABLE—IRON HOUSING AND SYNTHETIC RUBBER GASKET OF

CHILLED-WATER PIPING, ABOVEGROUND, NPS 2 (DN 50) AND SMALLER, SHALL BE THE I. SCHEDULE 40 STEEL PIPE: CLASS 150, MALLEABLE-IRON, 250, CAST-IRON AND 300, MALLEABLE-IRON FITTINGS; CAST-IRON FLANGES AND FLANGE FITTINGS; AND

CENTRAL CAVITY PRESSURE-RESPONSIVE DESIGN; WITH NUTS, BOLTS, LOCKING PIN, LOCKING

- CHILLED-WATER PIPING, ABOVEGROUND, NPS 2-1/2 (DN 65) AND LARGER, SHALL BE ANY OF THE FOLLOWING: SCHEDULE 40 STEEL PIPE WROUGHT-STEEL FITTINGS AND WROUGHT-CAST OF FORGED-STEEL FLANGES AND FLANGE FITTINGS, AND WELDED AND FLANGED JOINTS. 2. SCHEDULE 40 STEEL PIPE; GROOVED, MECHANICAL JOINT COUPLING AND FITTINGS;
- CONDENSATE-DRAIN PIPING: TYPE M (C) DRAWN-TEMPER COPPER TUBING, WROUGHT-COPPER FITTINGS, AND SOLDERED JOINTS.

TOGGLE, OR LUGS TO SECURE GROOVED PIPE AND FITTINGS.

AND GROOVED, MECHANICAL JOINTS.

- HANGERS AND SUPPORTS: INSTALL THE FOLLOWING PIPE ATTACHMENTS: 1. ADJUSTABLE STEEL CLEVIS HANGERS FOR INDIVIDUAL HORIZONTAL PIPING LESS THAN 2. ADJUSTABLE ROLLER HANGERS AND SPRING HANGERS FOR INDIVIDUAL HORIZONTAL
- PIPING 20 FEET (6 M) OR LONGER. 3. PIPE ROLLER: MSS SP-58, TYPE 44 FOR MULTIPLE HORIZONTAL PIPING 20 FEET (6 M) OR LONGER, SUPPORTED ON A TRAPEZE. SPRING HANGERS TO SUPPORT VERTICAL RUNS.

PROVIDE COPPER-CLAD HANGERS AND SUPPORTS FOR HANGERS AND SUPPORTS IN

- DIRECT CONTACT WITH COPPER PIPE. M. INSTALL HANGERS FOR STEEL PIPING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD SIZES: NPS 3/4 (DN 20): MAXIMUM SPAN, 7 FEET (2.1 M); MINIMUM ROD SIZE, 1/4 INCH (6.4 MM). NPS 1 (DN 25): MAXIMUM SPAN, 7 FEET (2.1 M); MINIMUM ROD SIZE, 1/4 INCH (6.4 MM).
 NPS 1-1/2 (DN 40): MAXIMUM SPAN, 9 FEET (2.7 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM). NPS 2 (DN 50): MAXIMUM SPAN, 10 FEET (3 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM). NPS 2-1/2 (DN 65): MAXIMUM SPAN, 11 FEET (3.4 M): MINIMUM ROD SIZE, 3/8 INCH (10 MM). NPS 3 (DN 80): MAXIMUM SPAN, 12 FEET (3.7 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM).
- NPS 4 (DN 100): MAXIMUM SPAN, 14 FEET (4.3 M): MINIMUM ROD SIZE, 1/2 INCH (13 MM) NPS 6 (DN 150): MAXIMUM SPAN, 17 FEET (5.2 M); MINIMUM ROD SIZE, 1/2 INCH (13 MM) NPS 8 (DN 200): MAXIMUM SPAN, 19 FEET (5.8 M); MINIMUM ROD SIZE, 5/8 INCH (16 MM). IO. NPS 10 (DN 250): MAXIMUM SPAN, 20 FEET (6.1 M); MINIMUM ROD SIZE, 3/4 INCH (19 MM) 12. NPS 14 (DN 350): MAXIMUM SPAN, 25 FEET (7.6 M); MINIMUM ROD SIZE, 1 INCH (25 MM) INSTALL HANGERS FOR DRAWN-TEMPER COPPER PIPING WITH THE FOLLOWING MAXIMUM
- SPACING AND MINIMUM ROD SIZES: NPS 3/4 (DN 20): MAXIMUM SPAN, 5 FEET (1.5 M); MINIMUM ROD SIZE, 1/4 INCH (6.4 MM). NPS 1 (DN 25): MAXIMUM SPAN, 6 FEET (1.8 M): MINIMUM ROD SIZE, 1/4 INCH (6.4 MM). NPS 1-1/2 (DN 40): MAXIMUM SPAN, 8 FEET (2.4 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM NPS 2 (DN 50): MAXIMUM SPAN, 8 FEET (2.4 M): MINIMUM ROD SIZE, 3/8 INCH (10 MM). . NPS 2-1/2 (DN 65): MAXIMUM SPAN, 9 FEET (2.7 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM). NPS 3 (DN 80): MAXIMUM SPAN, 10 FEET (3 M); MINIMUM ROD SIZE, 3/8 INCH (10 MM). CHILLED WATER AND BRINE, ABOVE 40 DEG F (5 DEG C):
- 1. NPS 12 (DN 300) AND SMALLER: INSULATION SHALL BE THE FOLLOWING: MINERAL-FIBER, PREFORMED PIPE, TYPE I, 1-1/2 INCHES (38 MM) THICK. 2. NPS 14 (DN 350) AND LARGER: INSULATION SHALL BE ONE OF THE FOLLOWING: MINERAL-FIBER PREFORMED PIPE, TYPE I, 1-1/2 INCHES (38 MM) THICK.
- CONDENSATE AND EQUIPMENT DRAIN WATER BELOW 60 DEG F (16 DEG C): 1. ALL PIPE SIZES: INSULATION SHALL BE ONE OF THE FOLLOWING: MINERAL-FIBER, PREFORMED PIPE INSULATION, TYPE I: 1 INCH (25 MM) THICK.

- MINERAL-FIBER BLANKET INSULATION: MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 553, TYPE II AND ASTM C 1290, TYPE III WITH FACTORY-APPLIED FSK JACKET. EQUIVALENT TO R-6. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING: CERTAINTEED CORP.: SOFTTOUCH DUCT WRAP.
- JOHNS MANVILLE: MICROLITE. KNAUF INSULATION; FRIENDLY FEEL DUCT WRAP. MANSON INSULATION INC.: ALLEY WRAP OWENS CORNING; SOFTR ALL-SERVICE DUCT WRAP.

FULLER COMPANY: CP-82

COMPANY: 30-80/30-90.

- MINERAL-FIBER ADHESIVE: COMPLY WITH MIL-A-3316C, CLASS 2, GRADE A PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS. PROVIDE ONE OF THE FOLLOWING: CHILDERS BRAND, SPECIALTY CONSTRUCTION BRANDS, INC., A BUSINESS OF H. B.
- FULLER COMPANY: CP-127. EAGLE BRIDGES - MARATHON INDUSTRIES: 225 FOSTER BRAND, SPECIALTY CONSTRUCTION BRANDS, INC., A BUSINESS OF H. B. FULLER COMPANY: 85-60/85-70.
- 4. MON-ECO INDUSTRIES, INC.; 22-25. FOR INDOOR APPLICATIONS, USE ADHESIVE THAT HAS A VOC CONTENT OF 80 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).
- . ASJ ADHESIVE, AND FSK JACKET ADHESIVE: COMPLY WITH MIL-A-3316C, CLASS 2, GRADE A FOR BONDING INSULATION JACKET LAP SEAMS AND JOINTS. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING: CHILDERS BRAND, SPECIALTY CONSTRUCTION BRANDS, INC., A BUSINESS OF H. B.
- EAGLE BRIDGES MARATHON INDUSTRIES; 225. FOSTER BRAND, SPECIALTY CONSTRUCTION BRANDS, INC., A BUSINESS OF H. B. FULLER 4. MON-ECO INDUSTRIES, INC.; 22-25.
- FOR INDOOR APPLICATIONS, USE ADHESIVE THAT HAS A VOC CONTENT OF 50 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).
- MATERIALS SHALL BE COMPATIBLE WITH INSULATION MATERIALS, JACKETS, AND SUBSTRATES; COMPLY WITH MIL-PRF-19565C, TYPE II. 1. FOR INDOOR APPLICATIONS, USE MASTICS THAT HAVE A VOC CONTENT OF 50 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).
- E. VAPOR-BARRIER MASTIC: WATER BASED; SUITABLE FOR INDOOR USE ON BELOW AMBIENT SERVICES. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOSTER BRAND, SPECIALTY CONSTRUCTION BRANDS, INC., A BUSINESS OF H. B. FULLER
- VIMASCO CORPORATION: 749 WATER-VAPOR PERMEANCE: ASTM E 96/E 96M, PROCEDURE B, 0.013 PERM (0.009 METRIC PERM) AT 43-MIL (1.09-MM) DRY FILM THICKNESS. SERVICE TEMPERATURE RANGE: MINUS 20 TO PLUS 180 DEG F (MINUS 29 TO PLUS 82 SOLIDS CONTENT: ASTM D 1644, 58 PERCENT BY VOLUME AND 70 PERCENT BY WEIGHT.
- FSK AND METAL JACKET FLASHING SEALANTS: PRODUCTS: SUBJECT TO COMPLIANCE WITH 1. CHILDERS BRAND, SPECIALTY CONSTRUCTION BRANDS, INC., A BUSINESS OF H. B. FULLER COMPANY: CP-76.
- EAGLE BRIDGES MARATHON INDUSTRIES; 405. FOSTER BRAND, SPECIALTY CONSTRUCTION BRANDS, INC., A BUSINESS OF H. B. FULLER COMPANY: 95-44.
- 4. MON-ECO INDUSTRIES, INC.; 44-05 MATERIALS SHALL BE COMPATIBLE WITH INSULATION MATERIALS, JACKETS, AND SUBSTRATES. FIRE— AND WATER-RESISTANT, FLEXIBLE, ELASTOMERIC SEALANT. SERVICE TEMPERATURE RANGE: MINUS 40 TO PLUS 250 DEG F (MINUS 40 TO PLUS 121
- FOR INDOOR APPLICATIONS, USE SEALANTS THAT HAVE A VOC CONTENT OF 420 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24). G. FSK TAPE: FOIL-FACE, VAPOR-RETARDER TAPE MATCHING FACTORY-APPLIED JACKET WITH
- ACRYLIC ADHESIVE; COMPLYING WITH ASTM C 1136. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING: ABI, IDEAL TAPE DIVISION: 491 AWE FSK AVERY DENNISON CORPORATION, SPECIALTY TAPES DIVISION; FASSON 0827.
- COMPAC CORPORATION; 110 AND 111. . VENTURE TAPE; 1525 CW NT, 1528 CW, AND 1528 CW/SQ.
- WIDTH: 3 INCHES (75 MM) THICKNESS: 6.5 MILS (0.16 MM ADHESION: 90 OUNCES FORCE/INCH (1.0 N/MM) IN WIDTH.
- ELONGATION: 2 PERCENT. TENSILE STRENGTH: 40 LBF/INCH (7.2 N/MM) IN WIDTH.
 FSK TAPE DISKS AND SQUARES: PRECUT DISKS OR SQUARES OF FSK TAPE.
- H. SECUREMENTS
- PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING: ITW INSULATION SYSTEMS: GERRARD STRAPPING AND SEALS. RPR PRODUCTS, INC.: INSUL-MATE STRAPPING, SEALS, AND SPRINGS. ALUMINUM: ASTM B 209 (ASTM B 209M), ALLOY 3003, 3005, 3105, OR 5005; TEMPER H-14,
- INSULATION PINS AND HANGERS CAPACITOR—DISCHARGE—WELD PINS: COPPER— OR ZINC—COATED STEEL PIN, FULLY ANNEALED FOR CAPACITOR-DISCHARGE WELDING, 0.106-INCH- (2.6-MM-) DIAMETER SHANK, LENGTH TO SUIT DEPTH OF INSULATION INDICATED. PRODUCTS: SUBJECT TO COMPLIANCE WITH

0.020 INCH (0.51 MM) THICK, 1/2 INCH (13 MM) WIDE WITH WING SEAL OR CLOSED SEAL

- REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING: AGM INDUSTRIES, INC.; CWP-1. MIDWEST FASTENERS. INC.: CD.
- I. NELSON STUD WELDING; TPA, TPC, AND TPS.
- INSTALLATION OF MINERAL-FIBER INSULATION: BLANKET INSULATION INSTALLATION ON DUCTS AND PLENUMS: SECURE WITH ADHESIVE AND INSULATION PINS. APPLY ADHESIVES ACCORDING TO MANUFACTURER'S RECOMMENDED COVERAGE RATES PER UNIT AREA, FOR 100 PERCENT COVERAGE OF DUCT AND PLENUM SURFACES. APPLY ADHESIVE TO ENTIRE CIRCUMFERENCE OF DUCTS AND TO ALL SURFACES OF FITTINGS AND TRANSITIONS. INSTALL EITHER CAPACITOR-DISCHARGE-WELD PINS AND SPEED WASHERS OR CUPPED-HEAD, CAPACITOR-DISCHARGE-WELD PINS ON SIDES AND BOTTOM OF HORIZONTAL
- DUCTS AND SIDES OF VERTICAL DUCTS AS FOLLOWS: 1. ON DUCT SIDES WITH DIMENSIONS 18 INCHES (450 MM) AND SMALLER, PLACE PINS ALONG LONGITUDINAL CENTERLINE OF DUCT. SPACE 3 INCHES (75 MM) MAXIMUM FROM INSULATION END JOINTS, AND 16 INCHES (400 MM) O.C. 2. ON DUCT SIDES WITH DIMENSIONS LARGER THAN 18 INCHES (450 MM), PLACE PINS 16 INCHES (400 MM) O.C. EACH WAY, AND 3 INCHES (75 MM) MAXIMUM FROM INSULATION
- JOINTS. `INSTALL' ADDITIONAL PINS TO HOLD INSULÀTION TÍGHTLY AGAINST SURFACE AT CROSS BRACING. 3. PINS MAY BE OMITTED FROM TOP SURFACE OF HORIZONTAL, RECTANGULAR DUCTS AND DO NOT OVERCOMPRESS INSULATION DURING INSTALLATION
- IMPALE INSULATION OVER PINS AND ATTACH SPEED WASHERS CUT EXCESS PORTION OF PINS EXTENDING BEYOND SPEED WASHERS OR BEND PARALLEL WITH INSULATION SURFACE. COVER EXPOSED PINS AND WASHERS WITH TAPE MATCHING INSULATION FACING. FOR DUCTS AND PLENUMS WITH SURFACE TEMPERATURES BELOW AMBIENT, INSTALL A CONTINUOUS UNBROKEN VAPOR BARRIER. CREATE A FACING LAP FOR LONGITUDINAL SEAMS
- AND END JOINTS WITH INSULATION BY REMOVING 2 INCHES (50 MM) FROM ONE EDGE AND ONE FND OF INSULATION SEGMENT. SECURE LAPS TO ADJACENT INSULATION SECTION WITH 1/2-INCH (13-MM) OUTWARD-CLINCHING STAPLES, 1 INCH (25 MM) O.C. INSTALL VAPOR BARRIER CONSISTING OF FACTORY- OR FIELD-APPLIED JACKET, ADHESIVE, VAPOR-BARRIER MASTIC, AND SEALANT AT JOINTS, SEAMS, AND PROTRUSIONS REPAIR PUNCTURES, TEARS, AND PENETRATIONS WITH TAPE OR MASTIC TO MAINTAIN VAPOR-BARRIER SEAL.
- 2. INSTALL VAPOR STOPS FOR DUCTWORK AND PLENUMS OPERATING BELOW 50 DEG F (10 DEG C) AT 18-FOOT (5.5-M) INTERVALS. VAPOR STOPS SHALL CONSIST OF VAPOR-BARRIER MASTIC APPLIED IN A Z-SHAPED PATTERN OVER INSULATION FACE, ALONG BUTT END OF INSULATION, AND OVER THE SURFACE. COVER INSULATION FACI AND SURFACE TO BE INSULATED A WIDTH EQUAL TO TWO TIMES THE INSULATION THICKNESS, BUT NOT LESS THAN 3 INCHES (75 MM). OVERLAP UNFACED BLANKETS A MINIMUM OF 2 INCHES (50 MM) ON LONGITUDINAL SEAMS AND
- END JOINTS. AT END JOINTS, SECURE WITH STEEL BANDS SPACED A MAXIMUM OF 18 INCHES (450 MM) O.C. INSTALL INSULATION ON RECTANGULAR DUCT ELBOWS AND TRANSITIONS WITH A FULL INSULATION SECTION FOR EACH SURFACE. INSTALL INSULATION ON ROUND AND FLAT-OVAL DUCT ELBOWS WITH INDIVIDUALLY MITERED GORES CUT TO FIT THE ELBOW. INSULATE DUCT STIFFENERS, HANGERS, AND FLANGES THAT PROTRUDE BEYOND INSULATION SURFACE WITH 6-INCH- (150-MM-) WIDE STRIPS OF SAME MATERIAL USED TO INSULATE DUCT. SECURE ON ALTERNATING SIDES OF STIFFENER, HANGER, AND FLANGE WITH PINS SPACED 6 INCHES (150 MM) O.C.

- A. FIBROUS-GLASS DUCT LINER: COMPLY WITH ASTM C 1071, NFPA 90A, OR NFPA 90B; AND WITH NAIMA AH124, "FIBROUS GLASS DUCT LINER STANDARD.
- B. MAXIMUM THERMAL CONDUCTIVITY: TYPE I, FLEXIBLE: 0.27 BTU X IN./H X SQ. FT. X DEG F (0.039 W/M X K) AT 75 DEG F (24 DEG C) MEAN TEMPERATURE. R6 EQUIVALENT. TYPE II, RIGID: 0.23 BTU X IN./H X SQ. FT. X DEG F (0.033 W/M X K) - R6 EQUIVALENT. ANTIMICROBIAL EROSION-RESISTANT COATING: APPLY TO THE SURFACE OF THE LINER THAT WILL FORM THE INTERIOR SURFACE OF THE DUCT TO ACT AS A MOISTURE REPELLENT AND EROSION-RESISTANT COATING. ANTIMICROBIAL COMPOUND SHALL BE TESTED FOR EFFICACY BY AN NRTL AND REGISTERED BY THE EPA FOR USE IN HVAC SYSTEMS.
 WATER-BASED LINER ADHESIVE: COMPLY WITH NFPA 90A OR NFPA 90B AND WITH ASTM C 916. FOR INDOOR APPLICATIONS, USE ADHESIVE THAT HAS A VOC CONTENT OF 80 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).
- C. SHOP APPLICATION OF DUCT LINER: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 7-11, "FLEXIBLE DUCT LINER INSTALLATION." ADHERE A SINGLE LAYER OF INDICATED THICKNESS OF DUCT LINER WITH 100 PERCENT ADHESIVE COVERAGE AT LINER CONTACT SURFACE AREA. ATTAINING INDICATED THICKNESS WITH MULTIPLE LAYERS OF DUCT LINER IS PROHIBITED.



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1 04/19/22 ISSUE FOR BID/PERMIT

HARRIS COUNTY **APPRAISAL**

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ME SPECIFICATIONS

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TME1.01

ME SPECIFICATIONS NO SCALE

ELECTRICAL SPECIFICATIONS

ELECTRICAL CONDUCTORS

SENATOR WIRE & CABLE COMPAN'

- MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF ALCAN PRODUCTS CORPORATION: ALCAN CARLE DIVISION AMERICAN INSULATED WIRE CORP.; A LEVITON COMPANY. GENERAL CABLE CORPORATION.
- COPPER CONDUCTORS: COMPLY WITH NEMA WC 70.
 CONDUCTOR INSULATION: COMPLY WITH NEMA WC 70 FOR TYPES THW, THHN-THWN, XHHW, UF, USE, MULTICONDUCTOR CABLE: COMPLY WITH NEMA WC 70 FOR ARMORED CABLE, TYPE AC, METAL-CLAD CABLE, TYPE MC .TYPE SO, AND TYPE USE WITH GROUND WIRE.
- CONDUCTOR MATERIAL APPLICATIONS: OPPER. SOLID FOR NO. 10 AWG AND SMALLER; STRANDED FOR NO. 8 AWG AND LARGER.
- CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS SERVICE ENTRANCE: TYPE THHN-THWN, SINGLE CONDUCTORS IN RACEWAY. TYPE SE OR USE MULTICONDUCTOR CABLE. EXPOSED FEEDERS: TYPE THHN-THWN, SINGLE CONDUCTORS IN RACEWAY.
- FEEDERS CONCEALED IN CEILINGS, WALLS, PARTITIONS, AND CRAWLSPACES: TYPE THHN-THWN, SINGLE CONDUCTORS IN RACEWAY.
- FEEDERS CONCEALED IN CONCRETE, BELOW SLABS-ON-GRADE, AND UNDERGROUND:
- FEEDERS INSTALLED BELOW RAISED FLOORING: TYPE THHN-THWN, SINGLE CONDUCTORS IN
- 6. EXPOSED BRANCH CIRCUITS, INCLUDING IN CRAWLSPACES: TYPE THHN-THWN, SINGLE CONDUCTORS IN RACEWAY, METAL-CLAD CABLE, TYPE MC.
- 7. BRANCH CIRCUITS CONCEALED IN CEILINGS, WALLS, AND PARTITIONS: TYPE THHN-THWN, SINGLE CONDUCTORS IN RACEWAY, ARMORED CABLE, TYPE AC. METAL-CLAD CABLE, TYPE MC.
- 8. BRANCH CIRCUITS CONCEALED IN CONCRETE, BELOW SLABS-ON-GRADE, AND UNDERGROUND: YPE THHN-THWN, SINGLE CONDUCTORS IN RACEWAY. 9. BRANCH CIRCUITS INSTALLED BELOW RAISED FLOORING: TYPE THHN-THWN, SINGLE CONDUCTORS
- IN RACEWAY OR ARMORED CABLE, TYPE AC, METAL-CLAD CABLE, TYPE MC.

 10. BRANCH CIRCUITS INSTALLED IN PATIENT CARE AREAS: TYPE HCF-MCAP OR AC-HCF WITH ASSEMBLY CERTIFIED AS AN EQUIPMENT GROUNDING CONDUCTOR AND A GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR CONNECTED TO ALL RECEPTACLES, METALLIC BOXES CONTAINING RECEPTACLES, AND ALL METALLIC EQUIPMENT CASING

GROUNDING

A. INSULATED CONDUCTORS: COPPER WIRE OR CABLE INSULATED FOR 600 V UNLESS OTHERWISE REQUIRED BY APPLICABLE CODE OR AUTHORITIES HAVING JURISDICTION.

- BARE COPPER CONDUCTORS SOLID CONDUCTORS: ASTM B 3. STRANDED CONDUCTORS: ASTM B 8.
- BONDING CABLE: 28 KCMIL, 14 STRANDS OF NO. 17 AWG CONDUCTOR, 1/4 INCH (6 MM) IN
- BONDING CONDUCTOR: NO. 4 OR NO. 6 AWG, STRANDED CONDUCTOR. BONDING JUMPER: COPPER TAPE, BRAIDED CONDUCTORS TERMINATED WITH COPPER FERRULES; 1-5/8 INCHES (41 MM) WIDE AND 1/16 INCH (1.6 MM) THICK.
- GROUNDING BUS: PREDRILLED RECTANGULAR BARS OF ANNEALED COPPER, 1/4 BY 4 INCHES (6.3 BY 100 MM) IN CROSS SECTION, WITH 9/32-INCH (7.14-MM) HOLES SPACED 1-1/8 INCHES (28 MM) APART. STAND-OFF INSULATORS FOR MOUNTING SHALL COMPLY WITH UL 891 FOR USE IN SWITCHBOARDS, 600 V. LEXAN, IMPULSE TESTED AT 5000 V

D. CONNECTORS: LISTED AND LABELED BY AN NRTL ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION FOR APPLICATIONS IN WHICH USED AND FOR SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS CONNECTED

- E. BOLTED CONNECTORS FOR CONDUCTORS AND PIPES: COPPER OR COPPER ALLOY, PRESSURE TYPE WITH AT LEAST TWO BOLTS. PIPE CONNECTORS: CLAMP TYPE, SIZED FOR PIPE.
- F. WELDED CONNECTORS: EXOTHERMIC-WELDING KITS OF TYPES RECOMMENDED BY KIT MANUFACTURER FOR MATERIALS BEING JOINED AND INSTALLATION CONDITIONS. G. BUS-BAR CONNECTORS: MECHANICAL TYPE, CAST SILICON BRONZE, SOLDERLESS
- H. CONDUCTORS: INSTALL SOLID CONDUCTOR FOR NO. 8 AWG AND SMALLER, AND STRANDED CONDUCTORS FOR NO. 6 AWG AND LARGER UNLESS OTHERWISE INDICATED

ISOLATED GROUNDING CONDUCTORS: GREEN-COLORED INSULATION WITH CONTINUOUS YELLOW STRIPE. ON FEEDERS WITH ISOLATED GROUND, IDENTIFY GROUNDING CONDUCTOR WHERE VISIBLE TO NORMAL INSPECTION, WITH ALTERNATING BANDS OF GREEN AND YELLOW TAPE, WITH AT LEAST THREE BANDS OF GREEN AND TWO BANDS OF YELLOW.

COMPRESSION-TYPE WIRE TERMINALS, AND LONG-BARREL, TWO-BOLT CONNECTION TO GROUND BUS

UNDERGROUND CONNECTIONS: WELDED CONNECTORS EXCEPT AT TEST WELLS AND AS OTHERWISE INDICATED. CONNECTIONS TO GROUND RODS AT TEST WELLS: BOLTED CONNECTORS. CONNECTIONS TO STRUCTURAL STEEL: WELDED CONNECTORS. K. EQUIPMENT GROUNDING:

PIPE AND EQUIPMENT GROUNDING CONDUCTOR TERMINATIONS: BOLTED CONNECTORS.

INSTALL INSULATED EQUIPMENT GROUNDING CONDUCTORS TO COMPLY WITH THE NEC AND AS

ELECTRICAL HANGERS AND SUPPORTS

CONDUCTOR TERMINATIONS AND CONNECTIONS:

A. COMPLY WITH NECA 1 AND NECA 101 FOR APPLICATION OF HANGERS AND SUPPORTS FOR ELECTRICAL EQUIPMENT AND SYSTEMS EXCEPT IF REQUIREMENTS IN THIS SECTION ARE STRICTER. MAXIMUM SUPPORT SPACING AND MINIMUM HANGER ROD SIZE FOR RACEWAY: SPACE SUPPORTS FOR EMT. IMC. AND RMC AS SCHEDULED IN NECA 1. WHERE ITS TABLE 1 LISTS MAXIMUM SPACINGS LESS THAN STATED IN NFPA 70. MINIMUM ROD SIZE SHALL BE 1/4 INCH (6 MM) IN DIAMETER. MULTIPLE RACEWAYS OR CABLES: INSTALL TRAPEZE—TYPE SUPPORTS FABRICATED WITH STEEL SLOTTED OR OTHER SUPPORT SYSTEM, SIZED SO CAPACITY CAN BE INCREASED BY AT LEAST 25 PERCENT IN FUTURE WITHOUT EXCEEDING SPECIFIED DESIGN LOAD LIMITS. SECURE RACEWAYS AND CABLES TO THESE SUPPORTS WITH TWO-BOLT CONDUIT CLAMPS. SPRING-STEEL CLAMPS DESIGNED FOR SUPPORTING SINGLE CONDUITS WITHOUT BOLTS MAY BE USED FOR 1-1/2-INCH (38-MM) AND SMALLER RACEWAYS SERVING BRANCH CIRCUITS AND COMMUNICATION SYSTÉMS ABOVÈ SUSPÉNDED CEILINGS AND FOR FASTENING RACEWAYS TO TRAPEZE SUPPORTS.

SUPPORT INSTALLATION: COMPLY WITH NECA 1 AND NECA 101 FOR INSTALLATION REQUIREMENTS EXCEPT AS SPECIFIED IN THIS ARTICLE

RACEWAY SUPPORT METHODS: IN ADDITION TO METHODS DESCRIBED IN NECA 1, EMT, IMC, AND RMC MAY BE SUPPORTED BY OPENINGS THROUGH STRUCTURE MEMBERS, AS PERMITTED IN

STRENGTH OF SUPPORT ASSEMBLIES: WHERE NOT INDICATED, SELECT SIZES OF COMPONENTS SO STRENGTH WILL BE ADEQUATE TO CARRY PRESENT AND FUTURE STATIC LOADS WITHIN SPECIFIED LOADING LIMITS. MINIMUM STATIC DESIGN LOAD USED FOR STRENGTH DETERMINATION SHALL BE WEIGHT OF SUPPORTED COMPONENTS PLUS 200 LB (90 KG).

F. MOUNTING AND ANCHORAGE OF SURFACE-MOUNTED EQUIPMENT AND COMPONENTS: ANCHOR AND FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTS TO BUILDING STRUCTURAL ELEMENTS BY THE FOLLOWING METHODS UNLESS OTHERWISE INDICATED BY CODE

- TO WOOD: FASTEN WITH LAG SCREWS OR THROUGH BOLTS. TO NEW CONCRETE: BOLT TO CONCRETE INSERTS. TO MASONRY: APPROVED TOGGLE-TYPE BOLTS ON HOLLOW MASONRY UNITS AND EXPANSION
- ANCHOR FASTENERS ON SOLID MASONRY UNITS.
 4. TO EXISTING CONCRETE: EXPANSION ANCHOR FASTENERS. INSTEAD OF EXPANSION ANCHORS, POWDER-ACTUATED DRIVEN THREADED STUDS PROVIDED WITH LOCK WASHERS AND NUTS MAY BE USED IN EXISTING STANDARD-WEIGHT CONCRETE 4 INCHES (100 MM) THICK OR GREATER. DO NOT USE FOR ANCHORAGE TO LIGHTWEIGHT-AGGREGATE

CONCRETE OR FOR SLABS LESS THAN 4 INCHES (100 MM) THICK.

6. TO STEEL: WELDED THREADED STUDS COMPLYING WITH AWS D1.1/D1.1M, WITH LOCK WASHERS AND NUTS OR BEAM CLAMPS (MSS TYPE 19, 21, 23, 25, OR 27) COMPLYING WITH MSS SP-69.
7. TO LIGHT STEEL: SHEET METAL SCREWS. DRILL HOLES FOR EXPANSION ANCHORS IN CONCRETE AT LOCATIONS AND TO DEPTHS THAT

ELECTRICAL CONDUIT

- A. METAL CONDUIT AND TUBING MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE AFC CABLE SYSTEMS, INC.
- ALFLEX INC ALLIED TUBE & CONDUIT; A TYCO INTERNATIONAL LTD. CO. ANAMET ELECTRICAL, INC.; ANACONDA METAL HOSE.
- FLECTRI—FLEX CO MAVERICK TUBE CORPORATION. O-Z GEDNEY; A UNIT OF GENERAL SIGNAL.
- WHEATLAND TUBE COMPANY. RIGID STEEL CONDUIT: ANSI C80.1
- ALUMINUM RIGID CONDUIT: ANSI C80.5. IMC: ANSI C80.6. PVC-COATED STEEL CONDUIT: PVC-COATED RIGID STEEL CONDUIT.
- COMPLY WITH NEMA RN 1. COATING THICKNESS: 0.040 INCH (1 MM), MINIMUM. EMT: ANSI C80.3 FMC: ZINC-COATED STEEL
- LFMC: FLEXIBLE STEEL CONDUIT WITH PVC JACKET. FITTINGS FOR CONDUIT (INCLUDING ALL TYPES AND FLEXIBLE AND LIQUIDTIGHT), EMT, AND CABLE: NEMA FB 1; LISTED FOR TYPE AND SIZE RACEWAY WITH WHICH USED, AND FOR APPLICATION AND ENVIRONMENT IN WHICH INSTALLED.
- FITTINGS FOR EMT: STEEL SET-SCREW OR COMPRESSION TYPE. DIE-CAST IS NOT 2. COATING FOR FITTINGS FOR PVC-COATED CONDUIT: MINIMUM THICKNESS, 0.040 INCH (
- MM), WITH OVERLAPPING SLEEVES PROTECTING THREADED JOINTS. JOINT COMPOUND FOR RIGID STEEL CONDUIT OR IMC: LISTED FOR USE IN CABLE CONNECTOR ASSEMBLIES, AND COMPOUNDED FOR USE TO LUBRICATE AND PROTECT THREADED RACEWAY JOINTS FROM CORROSION AND ENHANCE THEIR CONDUCTIVITY.
- SURFACE METAL RACEWAYS: GALVANIZED STEEL WITH SNAP-ON COVERS. MANUFACTURER'S STANDARD ENAMEL FINISH IN COLOR SELECTED BY ARCHITECT MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
- THOMAS & BETTS CORPORATION. WALKER SYSTEMS, INC.; WIREMOLD COMPANY (THE).
- WIREMOLD COMPANY (THE); ELECTRICAL SALES DIVISION. N. BOXES, ENCLOSURES, AND CABINETS:
 MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE COOPER CROUSE-HINDS; DIV. OF COOPER INDUSTRIES, INC.
- EGS/APPLETON ELECTRIC.
- HUBBELL INCORPORATED; KILLARK ELECTRIC MANUFACTURING CO. DIVISION. O-Z/GEDNEY; A UNIT OF GENERAL SIGNAL. RACO: A HUBBELL COMPANY. ROBROY INDUSTRIES, INC.; ENCLOSURE DIVISION.
- THOMAS & BETTS CORPORATION. WALKER SYSTEMS, INC.; WIREMOLD COMPANY (THE) SHEET METAL OUTLET AND DEVICE BOXES: NEMA OS 1.
- CAST-METAL OUTLET AND DEVICE BOXES: NEMA FB 1, FERROUS ALLOY, TYPE FD, WITH METAL FLOOR BOXES: CAST METAL, FULLY ADJUSTABLE, RECTANGULAR. SMALL SHEET METAL PULL AND JUNCTION BOXES: NEMA OS 1.
- CAST-METAL ACCESS, PULL, AND JUNCTION BOXES: NEMA FB 1, GALVANIZED, CAST IRON HINGED-COVER ENCLOSURES: NEMA 250, TYPE 1, WITH CONTINUOUS-HINGE COVER WITH FLUSH LATCH. UNLESS OTHERWISE INDICATED. 1. METAL ENCLOSURES: STEEL, FINISHED INSIDE AND OUT WITH MANUFACTURER'S
 - STANDARD ENAMEL A. IN STANDARD PARTITIONS, WHERE 1/2" AND 3/4" CONDUITS ARE EMPLOYED: 4" SQUARE BY 2-1/8" DEEP BOXES WITH 1-GANG OR 2-GANG PLASTER COVERS SHALL BE USED, NO. 4SD-SPL. B. IN THIN PARTITIONS MEASURING 3-1/2" OR LESS: 4" SQUARE BY 1-1/2" DEEP BOXES WITH 1-GANG OR 2-GANG PLASTER COVERS SHALL BE USED. NO. 4S-SPL C. IN STANDARD PARTITIONS. WHERE CONDUITS OF A SIZE GREATER THAN 3/4" ARE EMPLOYED: 4" SQUARE BY 2-1/8" DEEP BOXES WITH 1-GANG OR 2-GANG PLASTER COVERS SHALL BE USED. NO. 4SJD SERIES. THE OUTLET BOXES SHALL BE LOCATED WHEREBY NO TWO (2) OUTLET BOXES ARE INSTALLED CLOSER THAN 24" ON CENTER,

AND SECURELY ATTACHED TO THE PARTITION STUDS, WITH AT LEAST ONE (1)

- PARTITION STUD SEPARATING THE OUTLET BOXES. IT IS NOT ACCEPTABLE TO SECURE OUTLET BOXES ONLY TO DRYWALL PARTITION NEMA 250, TYPE 1. GALVANIZED-STEEL BOX WITH REMOVABLE INTERIOR PANEL AND REMOVABLE FRONT, FINISHED INSIDE AND OUT WITH MANUFACTURER'S STANDARD ENAMEL. HINGED DOOR IN FRONT COVER WITH FLUSH LATCH AND CONCEALED HINGE. KEY LATCH TO MATCH PANELBOARDS.
- METAL BARRIERS TO SEPARATE WIRING OF DIFFERENT SYSTEMS AND VOLTAGE. ACCESSORY FEET WHERE REQUIRED FOR FREESTANDING EQUIPMENT. RACEWAY APPLICATION: OUTDOORS: APPLY RACEWAY PRODUCTS AS SPECIFIED BELOW, UNLESS OTHERWISE INDICATED: EXPOSED CONDUIT: RIGID STEEL CONDUI CONCEALED CONDUIT, ABOVEGROUND: RIGID STEEL CONDUIT, EMT, RNC.
- UNDERGROUND CONDUIT: RNC, TYPE EPC-40-PVC, DIRECT BURIED. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): LFMC. BOXES AND ENCLOSURES, ABOVEGROUND: NEMA 250, TYPE 3R. W. COMPLY WITH THE FOLLOWING INDOOR APPLICATIONS, UNLESS OTHERWISE INDICATED:
- EXPOSED, NOT SUBJECT TO PHYSICAL DAMAGE: EMT. EVENCED NOT SUBJECT TO SEVERE PHYSICAL DAMAGE: EXPOSED AND SUBJECT TO SEVERE PHYSICAL DAMAGE: RIGID STEEL CONDUIT. INCLUDES RACEWAYS IN THE FOLLOWING LOCATIONS: LOADING DOCK, CORRIDORS USED FOR TRAFFIC OF MECHANIZED CARTS, FORKLIFTS, AND PALLET—HANDLING UNITS, MECHANICAL ROOMS. CONCEALED IN CEILINGS AND INTERIOR WALLS AND PARTITIONS: EMT.
- CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): FMC, EXCEPT USE LFMC IN DAMP OR WET LOCATIONS. DAMP OR WET LOCATIONS: RIGID STEEL CONDUIT.
- RACEWAYS FOR OPTICAL FIBER OR COMMUNICATIONS CABLE IN SPACES USED FOR ENVIRONMENTAL AIR: PLENUM-TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY. 8. RACEWAYS FOR OPTICAL FIBER OR COMMUNICATIONS CABLE RISERS IN VERTICAL SHAFTS: RISER-TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, EMT. 9. RACEWAYS FOR CONCEALED GENERAL PURPOSE DISTRIBUTION OF OPTICAL FIBER OR COMMUNICATIONS CABLE: GENERAL-USE, OPTICAL FIBER/COMMUNICATIONS CABLE
- RACEWAY, RISER-TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, PLENUM-TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, EMT. 10. BOXES AND ENCLOSURES: NEMA 250, TYPE 1, EXCEPT USE NEMA 250, TYPE 4X, STAINLESS STEEL IN DAMP OR WET LOCATIONS. MINIMUM RACEWAY SIZE: 1/2-INCH (16-MM) TRADE SIZE.
- RACEWAY FITTINGS: COMPATIBLE WITH RACEWAYS AND SUITABLE FOR USE AND LOCATION. 1. RIGID AND INTERMEDIATE STEEL CONDUIT: USE THREADED RIGID STEEL CONDUIT FITTINGS, UNLESS OTHERWISE INDICATED. UNLESS OTHERWISE INDICATED.

 PVC EXTERNALLY COATED, RIGID STEEL CONDUITS: USE ONLY FITTINGS LISTED FOR USE WITH THAT MATERIAL. PATCH AND SEAL ALL JOINTS, NICKS, AND SCRAPES IN PVC COATING AFTER INSTALLING CONDUITS AND FITTINGS. USE SEALANT RECOMMENDED BY
- INSTALLATION COMPLY WITH NECA 1 FOR INSTALLATION REQUIREMENTS APPLICABLE TO PRODUCTS SPECIFIED EXCEPT WHERE REQUIREMENTS ON DRAWINGS OR IN THIS ARTICLE ARE STRICTER. AA. KEEP RACEWAYS AT LEAST 6 INCHES (150 MM) AWAY FROM PARALLEL RUNS OF FLUES AND STEAM OR HOT-WATER PIPES. INSTALL HORIZÓNTAL RACEWAY RUNS ABOVE WATER AND
- AB. COMPLETE RACEWAY INSTALLATION BEFORE STARTING CONDUCTOR INSTALLATION. AC. SUPPORT RACEWAYS AS SPECIFIED IN "HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS." AD. ARRANGE STUB-UPS SO CURVED PORTIONS OF BENDS ARE NOT VISIBLE ABOVE THE FINISHED AE. INSTALL NO MORE THAN THE EQUIVALENT OF THREE 90-DEGREE BENDS IN ANY CONDUIT RUN
- EXCEPT FOR COMMUNICATIONS CONDUITS, FOR WHICH FEWER BENDS ARE ALLOWED.

 AF. CONCEAL CONDUIT AND EMT WITHIN FINISHED WALLS, CEILINGS, AND FLOORS, UNLESS OTHERWISE INDICATED. AG. RACEWAYS EMBEDDED IN SLABS:
- RUN CONDUIT LARGER THAN 1-INCH (27-MM) TRADE SIZE, PARALLEL OR AT RIGHT ANGLES TO MAIN REINFORCEMENT. WHERE AT RIGHT ANGLES TO REINFORCEMENT, PLACE CONDUIT CLOSE TO SLAB SUPPORT. ARRANGE RACEWAYS TO CROSS BUILDING EXPANSION JOINTS AT RIGHT ANGLES WITH EXPANSION FITTINGS. CHANGE FROM ENT TO RNC, TYPE EPC-40-PVC, RIGID STEEL CONDUIT, OR IMC BEFORE
- AH. THREADED CONDUIT JOINTS, EXPOSED TO WET, DAMP, CORROSIVE, OR OUTDOOR CONDITIONS: APPLY LISTED COMPOUND TO THREADS OF RACEWAY AND FITTINGS BEFORE MAKING UP JOINTS.
- FOLLOW COMPOUND MANUFACTURER'S WRITTEN INSTRUCTIONS. AI. RACEWAY TERMINATIONS AT LOCATIONS SUBJECT TO MOISTURE OR VIBRATION: USE INSULATING BUSHINGS TO PROTECT CONDUCTORS, INCLUDING CONDUCTORS SMALLER THAN
- AJ. INSTALL PULL WIRES IN EMPTY RACEWAYS. USE POLYPROPYLENE OR MONOFILAMENT PLASTIC LINE WITH NOT LESS THAN 200-LB (90-KG) TENSILE STRENGTH. LEAVE AT LEAST 12 INCHES (300 MM) OF SLACK AT EACH END OF PULL WIRE.
- AK. RACEWAYS FOR OPTICAL FIBER AND COMMUNICATIONS CABLE: INSTALL RACEWAYS, METALLIC AND NONMETALLIC, RIGID AND FLEXIBLE, AS FOLLOWS: 1. 3/4-INCH (19-MM) TRADE SIZE AND SMALLER: INSTALL RACEWAYS IN MAXIMUM LENGTHS OF 50 FEET (15 M).

CABINETS WHERE NECESSARY TO COMPLY WITH THESE REQUIREMENTS.

- 2. 1-INCH (25-MM) TRADE SIZÉ AND LARGER: INSTALL RACEWAYS IN MAXIMUM LENGTHS 3. INSTALL WITH A MAXIMUM OF TWO 90-DEGREE BENDS OR EQUIVALENT FOR EACH LENGTH OF RACEWAY UNLESS DRAWINGS SHOW STRICTER REQUIREMENTS. SEPARATE LENGTHS WITH PULL OR JUNCTION BOXES OR TERMINATIONS AT DISTRIBUTION FRAMES OR
- INSTALL RACEWAY SEALING FITTINGS AT SUITABLE, APPROVED, AND ACCESSIBLE LOCATIONS AND FILL THEM WITH LISTED SEALING COMPOUND. FOR CONCEALED RACEWAYS, INSTALL EACH FITTING IN A FLUSH STEEL BOX WITH A BLANK COVER PLATE HAVING A FINISH SIMILAR TO THAT OF ADJACENT PLATES OR SURFACES. INSTALL RACEWAY SEALING FITTINGS AT THE WHERE CONDUITS PASS FROM WARM TO COLD LOCATIONS, SUCH AS BOUNDARIES OF 2. WHERE OTHERWISE REQUIRED BY NFPA 70.

- AP. FLEXIBLE CONDUIT CONNECTIONS: USE MAXIMUM OF 48 INCHES (1219 MM) OF FLEXIBLE CONDUIT FOR RECESSED AND SEMIRECESSED LIGHTING FIXTURES. FOUIPMENT SUBJECT T /IBRATION, NOISE TRANSMISSION, OR MOVEMENT; AND FOR TRANSFORMERS AND MOTORS. USE LFMC IN DAMP OR WET LOCATIONS.
- RECESSED BOXES IN MASONRY WALLS: SAW-CUT OPENING FOR BOX IN CENTER OF MASONRY BLOCK, AND INSTALL BOX FLUSH WITH SURFACE OF WALL. SET METAL FLOOR BOXES LEVEL AND FLUSH WITH FINISHED FLOOR SURFACE. FIRESTOPPING APPLY FIRESTOPPING TO ELECTRICAL PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES TO RESTORE ORIGINAL FIRE-RESISTANCE RATING OF ASSEMBLY. PROVIDE SLEEVES FOR FLOOR PENETRATIONS EXTENDING 2" ABOVE FLOOR EXCEPT IN FINISHED AREAS WHERE

COORDINATED WITH ARCHITECT.

SOLA/HEVI-DUTY.

- A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING: ACME ELECTRIC CORPORATION: POWER DISTRIBUTION PRODUCTS DIVISION EATON ELECTRICAL INC.; CUTLER-HAMMER PRODUCTS. GENERAL ELECTRIC COMPANY. SIEMENS ENERGY & AUTOMATION, INC.
- SQUARE D; SCHNEIDER ELECTRIC. B. GENERAL TRANSFORMER REQUIREMENTS DESCRIPTION: FACTORY—ASSEMBLED AND —TESTED, AIR—COOLED UNITS FOR 60—HZ SERVICE. GRAIN—ORIENTED, NON—AGING SILICON STEEL.
- CONTINUOUS WINDINGS WITHOUT SPLICES EXCEPT FOR TAPS. INTERNAL COIL CONNECTIONS: BRAZED OR PRESSURE TYPE. C. COMPLY WITH NEMA ST 20, AND LIST AND LABEL AS COMPLYING WITH UL 1561. ONE LEG PER PHASE.
- D. ENCLOSURE: VENTILATED, NEMA 250, TYPE 2. CORE AND COIL SHALL BE ENCAPSULATED WITHIN RESIN COMPOUND, SEALING OUT MOISTURE AND AIR. ENCLOSURE: VENTILATED, NEMA 250, TYPE 3R. CORE AND COIL SHALL BE ENCAPSULATED WITHIN
- F. TRANSFORMER ENCLOSURE FINISH: COMPLY WITH NEMA 250. FINISH COLOR: GRAY.

RESIN COMPOUND, SEALING OUT MOISTURE AND AIR.

PERCENT TAPS BELOW NORMAL FULL CAPACITY

- TAPS FOR TRANSFORMERS SMALLER THAN 7.5 KVA: ONE 5 PERCENT TAP ABOVE NORMAL FULL H. TAPS FOR TRANSFORMERS 7.5 TO 24 KVA: ONE 5 PERCENT TAP ABOVE AND ONE 5 PERCENT TAP
- TAPS FOR TRANSFORMERS 25 KVA AND LARGER: TWO 2.5 PERCENT TAPS ABOVE AND TWO 2.5
- J. INSULATION CLASS: 220 DEG C, UL-COMPONENT-RECOGNIZED INSULATION SYSTEM WITH A MAXIMUM OF 115 DEG C RISE ABOVE 40 DEG C AMBIENT TEMPERATURE.
- K. ENERGY EFFICIENCY FOR TRANSFORMERS RATED 15 KVA AND LARGER: COMPLYING WITH DOE-2016 10 I. K-FACTOR RATING: TRANSFORMERS INDICATED TO BE K-FACTOR RATED SHALL COMPLY WITH UI 1561 REQUIREMENTS FOR NONSINUSDIDAL LOAD CURRENT—HANDLING CAPABILITY TO THE DEGREE DEFINED B'
 DESIGNATED K—FACTOR. UNIT SHALL NOT OVERHEAT WHEN CARRYING FULL—LOAD CURRENT WITH HARMONIC DISTORTION CORRESPONDING TO DESIGNATED K-FACTOR. INDICATE VALUE OF K-FACTOR ON
- TRANSFORMER NAMEDIATE. M. ELECTROSTATIC SHIELDING: EACH WINDING SHALL HAVE AN INDEPENDENT, SINGLE, FULL-WIDTH COPPER ELECTROSTATIC SHIELD ARRANGED TO MINIMIZE INTERWINDING CAPACITANCE. ARRANGE COIL LEADS AND TERMINAL STRIPS TO MINIMIZE CAPACITIVE COUPLING BETWEEN INPUT AND OUTPUT TERMINALS. INCLUDE SPECIAL TERMINAL FOR GROUNDING THE SHIELD. SHIELD EFFECTIVENESS: CAPACITANCE BETWEEN PRIMARY AND SECONDARY WINDINGS: NOT TO EXCEED 33 PICOFARADS OVER A FREQUENCY RANGE OF 20 HZ TO 1 MHZ. COMMON-MODE NOISE ATTENUATION: MINIMUM OF MINUS 120 DBA AT 0.5 TO 1.5 KHZ; MINIMUM OF MINUS 65 DBA AT 1.5 TO 100 KHZ. NORMAL-MODE NOISE ATTENUATION: MINIMUM
- N. FUNGUS PROOFING: PERMANENT FUNGICIDAL TREATMENT FOR COIL AND CORE. O. LUG RATING: ALL LUG CONNECTIONS SHALL BE RATED FOR CONNECTION OF 75 DEG C INSULATION

PANELBOARDS

- ENCLOSURES: FLUSH- AND SURFACE-MOUNTED CABINETS. RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION. INDOOR DRY AND CLEAN LOCATIONS: NEMA 250, TYPE 1. OUTDOOR LOCATIONS: NEMA 250, TYPE 3R. WET OR DAMP INDOOR LOCATIONS:
- B. FRONT: SECURED TO BOX WITH CONCEALED TRIM CLAMPS. FOR SURFACE-MOUNTED FRONTS, MATCH BOX DIMENSIONS: FOR FLUSH-MOUNTED FRONTS, OVERLAP BOX.
- HINGED FRONT COVER: ENTIRE FRONT TRIM HINGED TO BOX AND WITH STANDARD DOOR WITHIN HINGED TRIM COVER.
- PANELS AND TRIM: GALVANIZED STEEL, FACTORY FINISHED IMMEDIATELY AFTER CLEANING AND PRETREATING WITH MANUFACTURER'S STANDARD TWO-COAT, BAKED-ON FINISH CONSISTING OF PRIME COAT AND THERMOSETTING TOPCOAT.
- E. BACK BOXES: GALVANIZED STEEL. F. FUNGUS PROOFING: PERMANENT FUNGICIDAL TREATMENT FOR OVERCURRENT PROTECTIVE DEVICES AND OTHER COMPONENTS.
- G. DIRECTORY CARD: INSIDE PANELBOARD DOOR, MOUNTED IN TRANSPARENT CARD HOLDER. H. INCOMING MAINS LOCATION: TOP AND BOTTOM.
- PHASE, NEUTRAL AND GROUND BUSES: MATERIAL: TIN-PLATED ALUMINUM OR HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY. EQUIPMENT GROUND BUS: ADEQUATE FOR FEEDER AND BRANCH-CIRCUIT EQUIPMENT
- CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL AND SIZES. MATERIAL: TIN-PLATED ALUMINUM OR HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY. MAIN AND NEUTRAL LUGS: COMPRESSION TYPE. GROUND LUGS AND BUS-CONFIGURED TERMINATORS: COMPRESSION TYPE. FEED-THROUGH LUGS: COMPRESSION TYPE, SUITABLE FOR USE WITH CONDUCTOR MATERIAL. LOCATE AT OPPOSITE END OF BUS FROM INCOMING LUGS OR MAIN DEVICE. RATED FOR CONNECTION OF 75 DEG C INSULATED CONDUCTORS.
- PANELBOARD SHORT-CIRCUIT CURRENT RATING: FULLY RATED TO INTERRUPT SYMMETRICAL SHORT-CIRCUIT CURRENT AVAILABLE AT TERMINALS.
- LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING: EATON ELECTRICAL INC.; CUTLER-HAMMER BUSINESS UNIT. GENERAL ELECTRIC COMPANY; GE CONSUMER & INDUSTRIAL SIEMENS ENERGY & AUTOMATION, INC.
- SQUARE D; A BRAND OF SCHNEIDER ELECTRIC. PANELBOARDS: NEMA PB 1, LIGHTING AND APPLIANCE BRANCH-CIRCUIT TYPE. MAINS: CIRCUIT BREAKER OR LUGS ONLY.
 BRANCH OVERCURRENT PROTECTIVE DEVICES: BOLT-ON CIRCUIT BREAKERS, REPLACEABLE DOORS: CONCEALED HINGES; SECURED WITH FLUSH LATCH WITH TUMBLER LOCK; KEYED ALIKE.

LIGHTING FIXTURES

- A. GENERAL REQUIREMENTS FOR LIGHTING FIXTURES AND COMPONENTS. 1. RECESSED FIXTURES: COMPLY WITH NEMA LE 4 FOR CEILING COMPATIBILITY FOR 2. INCANDESCENT FIXTURES: COMPLY WITH UL 1598. WHERE LER IS SPECIFIED, TEST
- ACCORDING TO NEMA LE 5A. 3. FLUORESCENT FIXTURES: COMPLY WITH UL 1598. WHERE LER IS SPECIFIED, TEST ACCORDING TO NEMA LE 5 AND NEMA LE 5A AS APPLICABLE. 4. LFD FIXTURES: 4.1. LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY,
- AND MARKED FOR INTENDED LOCATION AND APPLICATION. 4.2. EACH LUMINAIRE TYPE SHALL BE BINNED WITHIN A THREE-STEP MACADAM ELLIPSE TO ENSURE COLOR CONSISTENCY AMONG LUMINAIRES. METAL PARTS: FREE OF BURRS AND SHARP CORNERS AND EDGES. SHEET METAL COMPONENTS: STEEL UNLESS OTHERWISE INDICATED. FORM AND SUPPORT TO PREVENT WARPING AND SAGGING. DOORS, FRAMES, AND OTHER INTERNAL ACCESS: SMOOTH OPERATING, FREE OF LIGHT LEAKAGE UNDER OPERATING CONDITIONS, AND DESIGNED TO PERMIT RELAMPING WITHOUT USE OF TOOLS. DESIGNED TO PREVENT DOORS, FRAMES,
- LENSES. DIFFUSERS. AND OTHER COMPONENTS FROM FALLING ACCIDENTALLY DURING RELAMPING AND WHEN SECURED IN OPERATING POSITION. DIFFUSERS AND GLOBES: 1. ACRYLIC LIGHTING DIFFUSERS: 100 PERCENT VIRGIN ACRYLIC PLASTIC. HIGH RESISTANCE TO YELLOWING AND OTHER CHANGES DUE TO AGING, EXPOSURE TO HEAT, AND UV 2. LENS THICKNESS: AT LEAST 0.125 INCH (3.175 MM) MINIMUM UNLESS OTHERWISE
- INDICATED UV STABILIZED. GLASS: ANNEALED CRYSTAL GLASS UNLESS OTHERWISE INDICATED. FACTORY—APPLIED LABELS: COMPLY WITH UL 1598. INCLUDE RECOMMENDED LAMPS AND BALLASTS. LABELS SHALL BE LOCATED WHERE THEY WILL BE READILY VISIBLE TO SERVICE PERSONNEL, BUT NOT SEEN FROM NORMAL VIEWING ANGLES WHEN LAMPS ARE IN PLACE.
- LABEL SHALL INCLUDE THE FOLLOWING LAMP AND BALLAST CHARACTERISTICS: 1. "USE ONLY" AND INCLUDE SPECIFIC LAMP TYPE. 2. LAMP DIAMETER CODE (T-4, T-5, T-8, T-12, ETC.), TUBE CONFIGURATION (TWIN, QUAD, TRIPLE, ETC.), BASE TYPE, AND NOMINAL WATTAGE FOR FLUORESCENT AND COMPACT FLUORESCENT LUMINAIRES. 3. LAMP TYPE, WATTAGE, BULB TYPE (ED17, BD56, ETC.) AND COATING (CLEAR OR COATED) FOR HID LUMINAIRES.

4. START TYPE (PREHEAT, RAPID START, INSTANT START, ETC.) FOR FLUORESCENT AND

COMPACT FLUORESCENT LUMINAIRES.

5. ANSI BALLAST TYPE (M98, M57, ETC.) FOR HID LUMINAIRES. CCT AND CRI FOR ALL LUMINAIRES. ELECTROMAGNETIC—INTERFERENCE FILTERS: FACTORY INSTALLED TO SUPPRESS CONDUCTED ECTROMAGNETIC INTERFERENCE AS REQUIRED BY MIL-STD-461E. FABRICATE LIGHTING FIXTURES WITH ONE FILTER ON EACH BALLAST INDICATED TO REQUIRE A FILTER.

BALLASTS

- BALLASTS FOR LINEAR FLUORESCENT LAMPS, GENERAL REQUIREMENTS FOR ELECTRONIC
- COMPLY WITH UL 935 AND WITH ANSI C82.11. DESIGNED FOR TYPE AND QUANTITY OF LAMPS SERVED BALLASTS SHALL BE DESIGNED FOR FULL LIGHT OUTPUT UNLESS ANOTHER BF, DIMMER, OR I-LEVEL CONTROL IS INDICATED.
- SOUND RATING: CLASS A. TOTAL HARMONIC DISTORTION RATING: LESS THAN 10 PERCENT TRANSIENT VOLTAGE PROTECTION: IEEE C62.41.1 AND IEEE C62.41.2, CATEGORY A OR
- OPERATING FREQUENCY: 42 KHZ OR HIGHER. LAMP CURRENT CREST FACTOR: 1.7 OR LESS. BE: 0.88 OR HIGHER
- POWER FACTOR: 0.95 OR HIGHER. PARALLEL LAMP CIRCUITS: MULTIPLE LAMP BALLASTS SHALL COMPLY WITH ANSI C82.11 AND HALL BE CONNECTED TO MAINTAIN FULL LIGHT OUTPUT ON SURVIVING LAMPS IF ONE OR MORE
- LUMINAIRES CONTROLLED BY OCCUPANCY SENSORS SHALL HAVE PROGRAMMED-START ELECTRONIC PROGRAMMED-START BALLASTS FOR T8 AND T5 AND T5HO LAMPS: COMPLY WITH ANSI C82.11 AND THE FOLLOWING: LAMP END-OF-LIFE DETECTION AND SHUTDOWN CIRCUIT FOR T5 DIAMETER LAMPS. AUTOMATIC LAMP STARTING AFTER LAMP REPLACEMENT.
 ELECTROMAGNETIC BALLASTS: COMPLY WITH ANSI C82.1; ENERGY SAVING, HIGH-POWER
- ACTOR, CLASS P, AND HAVING AUTOMATIC-RESET THERMAL PROTECTION. BALLAST MANUFACTURER CERTIFICATION: INDICATED BY LABEL.
 SINGLE BALLASTS FOR MULTIPLE LIGHTING FIXTURES: FACTORY WIRED WITH BALLAST ARRANGEMENTS AND BUNDLED EXTENSION WIRING TO SUIT FINAL INSTALLATION CONDITIONS WITHOUT MODIFICATION OR REWIRING IN THE FIELD.
- BALLASTS FOR COMPACT FLUORESCENT LAMPS DESCRIPTION: ELECTRONIC-PROGRAMMED RAPID-START TYPE, COMPLYING WITH UL 935 ANI WITH ANSI C 82.11, DESIGNED FOR TYPE AND QUANTITY OF LAMPS INDICATED. BALLAST SHALL BE DESIGNED FOR FULL LIGHT OUTPUT UNLESS DIMMER OR BI-LEVEL CONTROL IS INDICATED: LAMP END-OF-LIFE DETECTION AND SHUTDOWN CIRCUIT AUTOMATIC LAMP STARTING AFTER LAMP REPLACEMENT
- SOUND RATING: CLASS A TOTAL HARMONIC DISTORTION RATING: LESS THAN 20 PERCENT. TRANSIENT VOLTAGE PROTECTION: IEEE C62.41.1 AND IEEE C62.41.2, CATEGORY A OR OPERATING FREQUENCY: 20 KHZ OR HIGHER.
- BF: 0.95 OR HIGHER UNLESS OTHERWISE INDICATED. POWER FACTOR: 0.95 OR HIGHER. INTERFERENCE: COMPLY WITH 47 CFR 18, CH. 1, SUBPART C, FOR LIMITATIONS ON ELECTROMAGNETIC AND RADIO-FREQUENCY INTERFERENCE FOR NONCONSUMER EQUIPMENT.

LAMP CURRENT CREST FACTOR: 1.7 OR LESS.

FLUORESCENT LAMPS

- A. T8 RAPID-START LAMPS, RATED 32 W MAXIMUM, NOMINAL LENGTH OF 48 INCHES (1220 MM). 2800 INITIAL LUMENS (MINIMUM), CRI 85 (MINIMUM), COLOR TEMPERATURE 3000 K, AND AVERAGE RATED LIFE 20.000 HOURS UNLESS OTHERWISE INDICATED. B. T8 RAPID-START LAMPS, RATED 17 W MAXIMUM, NOMINAL LENGTH OF 24 INCHES (610 MM), 300 INITIAL LUMENS (MINIMUM), CRI 85 (MINIMUM), COLOR TEMPERATURE 3000 K, AND AVERAGE RATED LIFE OF 20,000 HOURS UNLESS OTHERWISE INDICATED.
- T5 RAPID-START LAMPS, RATED 28 W MAXIMUM, NOMINAL LENGTH OF 45.2 INCHES (1150 M), 2900 INITIAL LUMENS (MINIMUM), CRI 85 (MINIMUM), COLOR TEMPERATURE 3000 K, AND AVÉRAGE RATED LIFE OF 20,000 HOURS UNLESS OTHERWISE INDICATED. T5HO RAPID-START, HIGH-OUTPUT LAMPS. RATED 54 W MAXIMUM, NOMINAL LENGTH OF 45.2 INCHES (1150 MM), 5000 INITIAL LUMENS (MINIMUM), CRI 85 (MINIMUM), COLOR TEMPERATURE 4100 K, AND AVERAGE RATED LIFE OF 20,000 HOURS UNLESS OTHERWISE INDICATED. COMPACT FLUORESCENT LAMPS: 4-PIN, CRI 80 (MINIMUM), COLOR TEMPERATURE 3000 K,
- AVERAGE RATED LIFE OF 10,000 HOURS AT THREE HOURS OPERATION PER START, AND SUITABLE FOR USE WITH DIMMING BALLASTS UNLESS OTHERWISE INDICATED. 13 W: T4. DOUBLE OR TRIPLE TUBE. RATED 900 INITIAL LUMENS (MINIMUM) 18 W: T4. DOUBLE OR TRIPLE TUBE, RATED 1200 INITIAL LUMENS (MINIMUM). 26 W: T4. DOUBLE OR TRIPLE TUBE. RATED 1800 INITIAL LUMENS (MINIMUM).
- 32 W: T4. TRIPLE TUBE, RATED 2400 INITIAL LUMENS (MINIMUM). 42 W: T4. TRIPLE TUBE. RATED 3200 INITIAL LUMENS (MINIMUM) 57 W: T4. TRIPLE TUBE. RATED 4300 INITIAL LUMENS (MINIMUM)

7. 70 W: T4, TRIPLE TUBE, RATED 5200 INITIAL LUMENS (MINIMUM)

LED LAMPS

- MINIMUM LUMENS PER SCHEDULED FIXTURE. MINIMUM ALLOWABLE EFFICACY OF 85 LM/W. CRI OF MINIMUM 80. CCT PER SCHEDULED FIXTURE RATED LAMP LIFE OF 50,000 HOURS TO L70. DIMMABLE FROM 100 PERCENT TO 1 PERCENT OF MAXIMUM LIGHT OUTPUT. INTERNAL DRIVER.
- USER-REPLACEABLE LAMPS: BULB SHAPE COMPLYING WITH ANSI C78.79. 2. LAMP BASE COMPLYING WITH ANSI C81.61 OR IEC 60061-1.

WIRING DEVICES

- A. MANUFACTURERS:
- HUBBELL INCORPORATED; WIRING DEVICE-KELLUMS . LEVITON MFG. COMPANY INC.
- 4. PASS & SEYMOUR/LEGRAND; WIRING DEVICES & ACCESSORIES

. LEVITON; 16341-W (SINGLE), 16362-W (DUPLEX)

- B. ALL WIRING DEVICES TO BE WHITE OR COLOR AS SELECTED BY ARCHITECT. STRAIGHT BLADE RECEPTACLES: CONVENIENCE RECEPTACLES, 125 V, 20 A: COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION 5-20R, AND UL 498. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING:
- ANY EQUAL BY ABOVE LISTED MANUFACTURERS. D. ISOLATED-GROUND, DUPLEX CONVENIENCE RECEPTACLES, 125 V, 20 A: COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION 5-20R, AND UL 498. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING: 3. LEVITON: 16362-IGW. I. ANY EQUAL BY ABOVE LISTED MANUFACTURERS. DESCRIPTION: STRAIGHT BLADE; EQUIPMENT GROUNDING CONTACTS SHALL BE CONNECTED ONLY TO THE GREEN GROUNDING SCREW TERMINAL OF THE DEVICE AND WITH INHERENT ELECTRICAL ISOLATION FROM MOUNTING STRAP. ISOLATION SHALL BE INTEGRAL TO
- RECEPTACLE CONSTRUCTION AND NOT DEPENDENT ON REMOVABLE PARTS. GFCI RECEPTACLES GENERAL DESCRIPTION: STRAIGHT BLADE, FEED-THROUGH TYPE. COMPLY WITH NEMA WD 1, NEMA WD 6, UL 498, AND UL 943, CLASS A, AND INCLUDE INDICATOR LIGHT THAT IS LIGHTED WHEN DEVICE IS TRIPPED, DUPLEX GECL CONVENIENCE RECEPTACLES, 125 V. 20 A: PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING: LEVITON: 7899-W
- 2. ANY EQUAL BY ABOVE LISTED MANUFACTURERS. SNAP SWITCHES, COMPLY WITH NEMA WD 1 AND UL 20. SWITCHES, 120/277 V, 20 A: PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING:.
- 1. LEVITON; 5621-2W (SINGLE POLE), 5622-2 (TWO POLE), 5623-2 (THREE WAY)
 2. ANY EQUAL BY ABOVE LISTED MANUFACTURERS. G. WALL-BOX DIMMERS, DIMMER SWITCHES: MODULAR, FULL-WAVE, SOLID-STATE UNITS WITH INTEGRAL, QUIET ON-OFF SWITCHES, WITH AUDIBLE FREQUENCY AND EMI/RFI SUPPRESSION FILTERS. CONTROL: CONTINUOUSLY ADJUSTABLE SLIDER; WITH SINGLE-POLE OR THREE-WAY SWITCHING. COMPLY WITH UL 1472.
- INCANDESCENT LAMP DIMMERS: 120 V; CONTROL SHALL FOLLOW SQUARE—LAW DIMMING CURVE. ON—OFF SWITCH POSITIONS SHALL BYPASS DIMMER MODULE. 2000 W; DIMMERS SHALL REQUIRE NO DERATING WHEN GANGED WITH OTHER DEVICES. FLUORESCENT LAMP DIMMER SWITCHES: MODULAR; COMPATIBLE WITH DIMMER BALLASTS; TRIM POTENTIOMETER TO ADJUST LOW-END DIMMING; DIMMER-BALLAST COMBINATION CAPABLE OF CONSISTENT DIMMING WITH LOW END NOT GREATER THAN 20 PERCENT OF 3. ACCEPTABLE MANUFACTURERS: LUTRON, LEVITON.
- H. VACANCY/OCCUPANCY SENSORS, WALL—SWITCH SENSORS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING: . LUTRON; MS-B102. (PROGRAMMED FOR VACANCY OR OCCUPANCY OPERATION AS SHOWN) ANY EQUAL BY NOVITAS, WATTSTOPPER, LEVITON OR SENSOR SWITCH. DESCRIPTION: DUAL TECHNOLOGY TYPE, 120/277 V, ADJUSTABLE TIME DELAY UP TO 20 MINUTES, 180-DEGREE FIELD OF VIEW, WITH A MINIMUM COVERAGE AREA OF 900 SQ. FT. (81 SQ. M). MANUAL-ON/AUTO-OFF OR AUTO-ON TO 50%/AUTO-OFF.
- WALL PLATES, SINGLE AND COMBINATION TYPES TO MATCH CORRESPONDING WIRING DEVICES. PLATE-SECURING SCREWS: METAL WITH HEAD COLOR TO MATCH PLATE FINISH. 1. MATERIAL FOR FINISHED SPACES: SMOOTH, HIGH-IMPACT THERMOPLASTIC 0.035-INCH-(1-MM-) THICK.
- 2. MATERIAL FOR UNFINISHED SPACES: SMOOTH, HIGH—IMPACT THERMOPLASTIC. 3. MATERIAL FOR DAMP LOCATIONS: THERMOPLASTIC WITH SPRING—LOADED LIFT COVER, AND LISTED AND LABELED FOR USE IN "WET LOCATIONS." 4. WET-LOCATION, WEATHERPROOF COVER PLATES: NEMA 250, COMPLYING WITH TYPE 3R WEATHER-RESISTANT, THERMOPLASTIC WITH LOCKABLE COVER.

DEVICE MOUNTING HEIGHTS

IN GENERAL, UNLESS OTHERWISE NOTED ON THE ARCHITECTURAL DRAWINGS OR THE ELECTRICAL DRAWINGS, MOUNTING HEIGHTS SHALL BE AS FOLLOWS: (HEIGHTS SHOWN ARE ABOVE FINISHED FLOOR TO CENTER LINE OF OUTLET)

48 INCHES

18 INCHES

90 INCHES

42 INCHES

42 INCHES

80 INCHES

80 INCHES 42 INCHES

WALL SWITCHES ELECTRICAL, VOICE/DATA OUTLETS CLOCK OUTLETS RECEPTACLES (MOUNTED ABOVE A COUNTER) FIRE ALARM PULL STATIONS FIRE ALARM SYSTEM AUDIO/VISUAL STROBES FIRE ALARM SYSTEM VISUAL STROBES WALL MOUNTED TELEPHONE

FIRE PROTECTION

FIRE ALARM

- A. DO NOT INTERRUPT FIRE-ALARM SERVICE TO FACILITIES OCCUPIED BY OWNER OR OTHERS UNLESS PERMITTED UNDER THE FOLLOWING CONDITIONS AND THEN ONLY AFTER ARRANGING TO
- B. NOTIFY ARCHITECT AND OWNER NO FEWER THAN TWO DAYS IN ADVANCE OF PROPOSED INTERRUPTION OF FIRE-ALARM SERVICE. DO NOT PROCEED WITH INTERRUPTION OF FIRE-ALARM SERVICE WITHOUT ARCHITECT'S AND OWNER'S WRITTEN PERMISSION.
- C. MAINTAIN EXISTING EQUIPMENT FULLY OPERATIONAL UNTIL NEW EQUIPMENT HAS BEEN TESTED AND ACCEPTED. AS NEW EQUIPMENT IS INSTALLED, LABEL IT "NOT IN SERVICE" UNTIL IT IS ACCEPTED. REMOVE LABELS FROM NEW EQUIPMENT WHEN PUT INTO SERVICE AND LABEL
- EXISTING FIRE-ALARM EQUIPMENT "NOT IN SERVICE" UNTIL REMOVED FROM THE BUILDING. D. AFTER ACCEPTANCE OF NEW FIRE-ALARM SYSTEM, REMOVE EXISTING DISCONNECTED
- FIRE-ALARM EQUIPMENT AND WIRING. E. COMPLY WITH NFPA 72 FOR INSTALLATION OF FIRE-ALARM EQUIPMENT
- F. VERIFY THAT EXISTING FIRE-ALARM SYSTEM IS OPERATIONAL BEFORE MAKING CHANGES OR CONNECTIONS. CONNECT NEW EQUIPMENT TO EXISTING CONTROL PANEL IN EXISTING PART O THE BUILDING. CONNECT NEW EQUIPMENT TO EXISTING MONITORING EQUIPMENT AT THE UPERVISING STATION. EXPAND, MODIFY, AND SUPPLEMENT EXISTING CONTROL AND MONITORING FOLIPMENT AS NECESSARY TO EXTEND EXISTING CONTROL AND MONITORING FUNCTIONS TO THE NEW POINTS. NEW COMPONENTS SHALL BE CAPABLE OF MERGING WITH EXISTING CONFIGURATION WITHOUT DEGRADING THE PERFORMANCE OF EITHER SYSTEM.
- G. COMPLY WITH NEPA 72. "SMOKE-SENSING FIRE DETECTORS" SECTION IN THE "INITIATING DEVICES" CHAPTER, FOR SMOKE-DETECTOR SPACING, COMPLY WITH NFPA 72, "HEAT-SENSING FIRE DETECTORS" SECTION IN THE "INITIATING DEVICES" CHAPTER, FOR HEAT-DETECTOR SPACING. SMOOTH CEILING SPACING SHALL NOT EXCEED 30 FEET (9 M). SPACING OF DETECTORS FOR IRREGULAR AREAS. FOR IRREGULAR CEILING CONSTRUCTION. AND FOR HIGH CEILING AREAS SHALL BE DETERMINED ACCORDING TO APPENDIX A OR APPENDIX B IN
- H. LOCATE DETECTORS NOT CLOSER THAN 3 FEET (1 M) FROM AIR-SUPPLY DIFFUSER OR
- LIGHTING FIXTURES: LOCATE DETECTORS NOT CLOSER THAN 12 INCHES (300 MM) FROM ANY
- J. DUCT SMOKE DETECTORS: COMPLY WITH NFPA 72 AND NFPA 90A. INSTALL SAMPLING TUBES SO THEY EXTEND THE FULL WIDTH OF DUCT K. REMOTE STATUS AND ALARM INDICATORS: INSTALL NEAR EACH SMOKE DETECTOR AND EACH
- SPRINKLER WATER-FLOW SWITCH AND VALVE-TAMPER SWITCH THAT IS NOT READILY VISIBLE FROM NORMAL VIEWING POSITION. L. AUDIBLE ALARM-INDICATING DEVICES: INSTALL NOT LESS THAN 6 INCHES (150 MM) BELOW THE CEILING. INSTALL BELLS AND HORNS ON FLUSH-MOUNTED BACK BOXES WITH THE
- DEVICE-OPERATING MECHANISM CONCEALED BEHIND A GRILLE M. VISIBLE ALARM-INDICATING DEVICES: INSTALL ADJACENT TO EACH ALARM BELL OR ALARM
- HORN AND AT LEAST 6 INCHES (150 MM) BELOW THE CEILING. N. PROVIDE FIELD TESTING AS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION. O. VISUAL ALARMS SHALL BE PROVIDED IN EACH OF THE FOLLOWING AREAS: RESTROOMS AND
- . AUDIBLE ALARMS SHALL PRODUCE A SOUND THAT EXCEEDS THE AMBIENT SOUND LEVEL IN A ROOM OR SPACE BY AT LEAST 15 DBA OR EXCEEDS ANY MAXIMUM SOUND LEVEL WITH A DURATION OF 60 SECONDS BY 5 DBA, WHICHEVER IS LOUDER. SOUND LEVELS FOR ALARM

ANY OTHER GENERAL USE AREAS, MEETING ROOMS, HALLWAYS, LOBBIES, AND ANY OTHER

- Q. VISUAL ALARM SIGNAL APPLIANCES SHALL BE INTEGRATED INTO THE BUILDING OR FACILITY ALARM SYSTEM. IF SINGLE STATION AUDIBLE ALARMS ARE PROVIDED THEN SINGLE STATION VISUAL SIGNALS SHALL BE PROVIDED.
- R. VISUAL ALARMS SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS: THE LAMP SHALL BE A XENON STROBE TYPE OR EQUIVALENT.

SIGNALS SHALL NOT EXCEED 110 DE

PART OF A LIGHTING FIXTURE.

- 2. THE COLOR SHALL BE CLEAR OR WHITE. 3. MAXIMUM PULSE DURATION SHALL BE 0.2 SECONDS WITH MAXIMUM DUTY CYCLE OF 40%.
- 4. INTENSITY SHALL BE A MINIMUM OF 75 CANDELA. 5. FLASH RATE SHALL BE A MINIMUM OF 1 HZ AND A MAXIMUM OF 3 HZ.
- 6. THE APPLIANCE SHALL BE PLACED 80" ABOVE THE HIGHEST FLOOR LEVEL WITHIN THE SPACE OR 6" BELOW THE CEILING, WHICHEVER IS LOWER. 7. IN GENERAL, NO PLACE IN ANY ROOM OR SPACE SHALL BE MORE THAN 50' FROM THE

SIGNAL. IN LARGE ROOMS OR SPACES EXCEEDING 100' ACROSS, WITHOUT OBSTRUCTIONS

PERIMETER, SPACED A MAXIMUM 100' APART, IN LIEU OF SUSPENDING APPLIANCES FROM

6' ABOVE THE FLOOR, SUCH AS AUDITORIUMS, DEVICES MAY BE PLACED AROUND THE

8. NO PLACE IN COMMON CORRIDORS OR HALLWAYS SHALL BE MORE THAN 50' FROM THE SIGNAL. SIGNALS SHALL NOT BE GREATER THAN 15' FROM THE END OF A CORRIDOR OR



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HARRIS COUNTY **APPRAISAL**

13013 NORTHWEST FREEWAY

HOUSTON, TX 77040

LEVEL 1

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PHILIP EWALD ARCHITECTURE INCORPORATED

Architecture | Interior Design | Planning

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ME SPECIFICATIONS

TME2.01

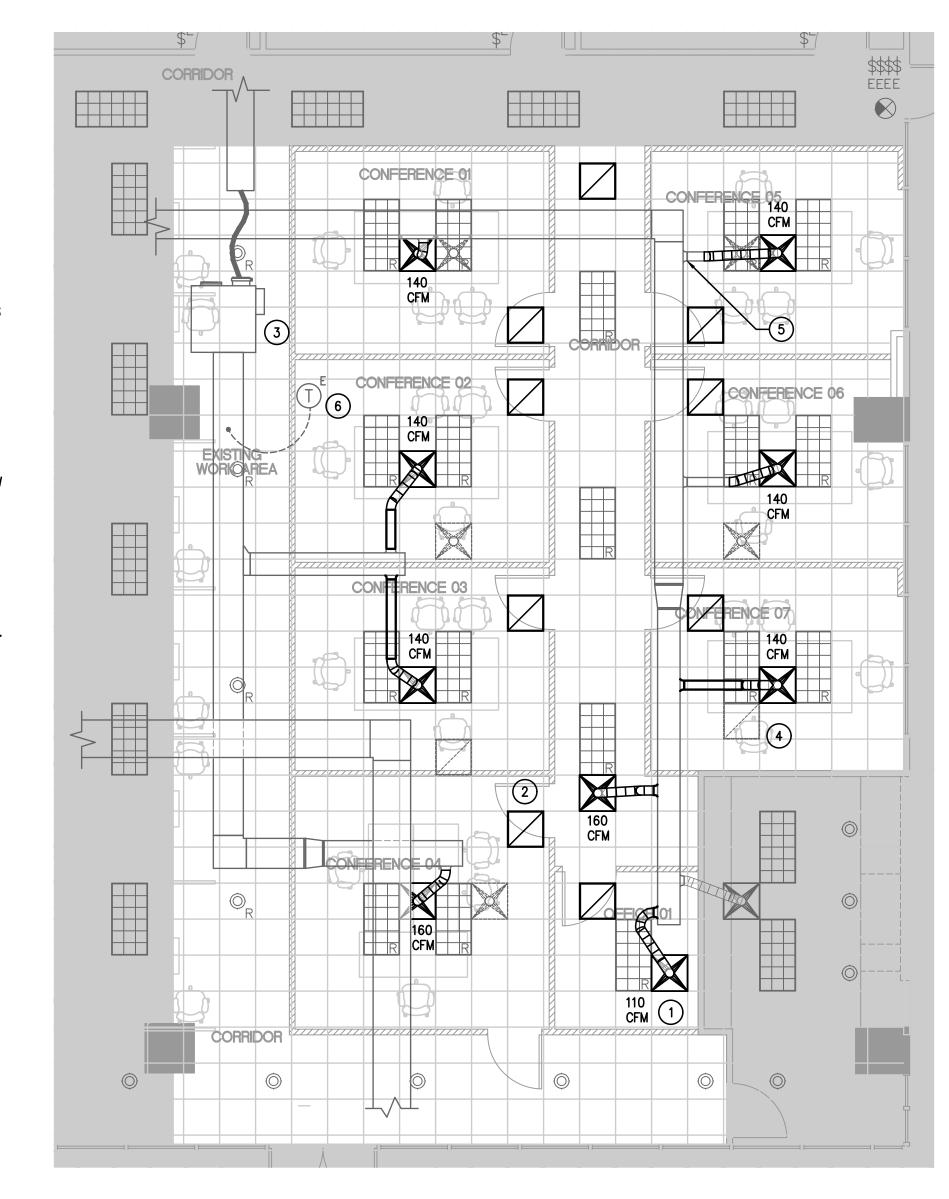
ME SPECIFICATIONS

NO SCALE

MECHANICAL GENERAL NOTES:

- 1. ALL WORK SHALL BE PERFORMED IN A CLEAN AND WORKMANLIKE MANNER. CARE SHALL BE EXERCISED TO MINIMIZE ANY INCONVENIENCE OR DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION. ISOLATE WORK AREAS BY MEANS OF TEMPORARY PARTITIONS AND/OR TARPS TO KEEP DUST AND DIRT WITHIN THE CONSTRUCTION AREA.
- 2. NO PIPING, EQUIPMENT, ETC. SHALL BE REMOVED, DISCONNECTED OR SHUT DOWN WITHOUT PRIOR REVIEW WITH THE LANDLORD AND/OR ENGINEER TO CONFIRM THAT AREAS TO REMAIN IN OPERATION WILL NOT BE AFFECTED. IF ANY AREAS NOT WITHIN THE SCOPE OF WORK ARE AFFECTED BY ANY SHUTDOWN, REMOVAL OR DISCONNECTION, SUFFICIENT ADVANCE NOTICE MUST BE GIVEN TO THE LANDLORD INDICATING WHICH AREAS WILL BE AFFECTED, WHEN THE PROPOSED SHUTDOWN WILL OCCUR, AND FOR HOW LONG A PERIOD OF TIME.
- 3. ALL ITEMS REMOVED SHALL BECOME PROPERTY OF THE LANDLORD AND SHALL BE DISPOSED OF AS PER THE LANDLORD'S INSTRUCTIONS, UNLESS INDICATED OTHERWISE. ALL ITEMS WHICH ARE NOT TO BE STORED ON SITE BY OWNERS SHALL BE REMOVED FROM THE BUILDING IMMEDIATELY.
- 4. THIS CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCY SHALL BE REPORTED TO THE LANDLORD AND/OR ENGINEER FOR EXPEDITING AND THE RESOLUTION.
- 5. CLEAN THE JOB SITE DAILY AND REMOVE FROM THE PREMISES ANY DIRT AND DEBRIS CAUSED BY THE PERFORMANCE OF THE WORK INCLUDED IN THIS CONTRACT.
- 6. USE OF THE LANDLORD'S ELEVATORS AND BUILDING CORRIDORS FOR HANDLING OF THE LANDLORD'S AND REMOVED EQUIPMENT AND MATERIALS SHALL BE AT THE DIRECTION OF THE LANDLORD AND SHALL BE COORDINATED WITH HIS OPERATIONS.
- 7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFEKEEPING OF HIS OWN PROPERTY ON THE JOB SITE. OWNER ASSUMES NO RESPONSIBILITY FOR PROTECTION OF PROPERTIES AGAINST FIRE, THEFT AND ENVIRONMENTAL CONDITIONS.
- 8. EXISTING MATERIALS THAT ARE REMOVED SHALL NOT BE REUSED IN NEW SYSTEMS, EXCEPT WHERE INDICATED AS BEING RELOCATED.
- 9. PROVIDE ALL NECESSARY TEMPORARY OR PERMANENT CAPS OR PLUGS FOR PIPING. DO NOT LEAVE PIPING OPEN ENDED.
- 10. WHERE USED, THE TERM "PROVIDE" SHALL MEAN "FURNISH AND INSTALL".
- 11. THIS CONTRACTOR SHALL COORDINATE HIS WORK WITH THE LANDLORD AND ALL OTHER TRADES PRIOR TO FABRICATION, PURCHASE AND/OR INSTALLATION OF ALL WORK.
- 12. SUBMISSION OF PROPOSAL DIRECTLY OR INDIRECTLY IN CONNECTION WITH THIS WORK SHALL IMPLY THAT THE BIDDER HAS EXAMINED THE JOB SITE UNDER WHICH HE WILL BE OBLIGATED TO OPERATE SHOULD HE BE AWARDED THE WORK UNDER THIS CONTRACT. NO EXTRA CHARGE WILL BE ALLOWED FOR FAILURE OF ANY BIDDER TO EXAMINE THE SITE PRIOR TO BID.
- 13. ALL WORK SHALL CONFORM TO ALL STATE AND LOCAL CODES, RULES AND REGULATIONS AND ORDINANCES.
- 14. CONTRACTOR SHALL SECURE AND PAY ALL FEES AND PERMITS PERTAINING TO THE CONTRACT.
- 15. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. THE

- CONTRACTOR SHALL PROVIDE ALL HANGERS AND SUPPORTS REQUIRED FOR A COMPLETE INSTALLATION.
- 16. CONTRACTOR SHALL BE RESPONSIBLE FOR WORKMEN'S IDENTIFICATION AND BADGING, SAFETY AND FIRE PROTECTION, CONTRACTOR'S LIABILITY INSURANCE, BARRICADES, WARNING SIGNS, TRASH REMOVAL, CUTTING AND PATCHING.
- 17. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RIGGING, HANDLING AND PROTECTION OF MATERIALS.
- 18. CONTRACTOR SHALL PROVIDE LABOR TO RECEIVE, UNLOAD, STORE, PROTECT AND TRANSFER TO POINT OF INSTALLATION, OWNER FURNISHED ITEMS.
- 19. WHERE CONDUIT, CABLES, DUCTWORK OR PIPING PASSES THROUGH FIRE RATED FLOORS OR WALLS, THE SLEEVES SHALL BE COMPLETELY SEALED WITH A FIRE STOP MATERIAL THAT IS UL LISTED AND ACCEPTED BY THE BUILDING DEPARTMENT AND FIRE DEPARTMENT AS BEING SUITABLE FOR THIS SERVICE.
- 20. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CORING AS IT RELATES TO HIS WORK.
- 21. CONTRACTOR SHALL REFER TO BUILDING MANAGEMENT'S RULES AND REGULATIONS' TO COMPLY WITH BUILDING STANDARDS.
- 22. FLEXIBLE DUCTWORK LENGTHS SHALL NOT EXCEED 5'-0". USE INSULATED RIGID ROUND DUCTWORK WHERE REQUIRED. ALL NEW FLEXIBLE DUCTWORK CONNECTIONS TO AIR DEVICES SHOWN ON THE DRAWING SHALL BE SIZED ACCORDING TO THE NECK SIZE SCHEDULE.
- 23. THE ENTIRE AIR SUPPLY SYSTEM SHALL BE RE-BALANCED TO THE AIR QUANTITIES INDICATED ON THIS DRAWING BY AN INDEPENDENT AIR BALANCE CONTRACTOR. THE AIR BALANCE CONTRACTOR SHALL SUBMIT NEBB CERTIFIED AIR BALANCE REPORTS FOR ENGINEERING REVIEW AND TO BUILDING MANAGEMENT. PROVIDE AHU DRIVE ADJUSTMENTS AS REQUIRED.
- 24. REFER TO DRAWING MEP FOR SPECIFICATIONS THAT APPLY TO THIS SHEET.
- 25. CONTRACTOR SHALL VERIFY THAT SUFFICIENT RETURN AIR OPENINGS ARE PROVIDED IN EXISTING WALLS ABOVE CEILING. AIR IS RETURNED TO THE CEILING PLENUM AND THEN TO THE AIR HANDLING UNITS THROUGH RETURN AIR GRILLES, ARCHITECTURAL CEILING OPENING AND LIGHT FIXTURES.
- 26. EXISTING TAPS TO SUPPLY DUCTWORK SHALL BE USED WHERE POSSIBLE. ANY UNUSED TAPS TO EXISTING SUPPLY DUCTWORK SHALL BE CAPPED, SEALED AIRTIGHT, AND INSULATED.
- 27. EXISTING MAIN TRUNK SUPPLY DUCTWORK SHALL REMAIN.
 CONTRACTOR SHALL VERIFY EXISTING LOCATION AND LIGHTING
 FIXTURE CLEARANCES AND INCLUDE IN THEIR COST THE
 RELOCATION OR REMOVAL OF EXISTING EQUIPMENT REQUIRED
 TO COMPLY WITH THIS DRAWING.
- 28. CONTRACTOR SHALL PROVIDE TO BUILDING OWNER THE AS-BUILT RECORD DRAWINGS AND THE OPERATING AND MAINTENANCE MANUALS WITHIN 90 DAYS OF SYSTEMS ACCEPTANCE. RECORD DRAWINGS SHALL INCLUDE PERFORMANCE DATA FOR EQUIPMENT, DUCT AND PIPE DISTRIBUTION SYSTEMS, AND AIR AND WATER FLOW RATES. O&M MANUALS SHALL INCLUDE EQUIPMENT AND ASSOCIATED OPTIONS REQUIRING SERVICE, REQUIRED MAINTENANCE ACTIVITIES, CONTACT INFO OF SERVICE AGENCIES, HVAC CONTROLS CALIBRATION INFORMATION AND SET-POINTS, AND DESCRIPTION OF EQUIPMENTS' INTENDED OPERATIONS.
- 29. FOR RETURN AIR PLENUMS, ALL MATERIALS LOCATED WITHIN A RETURN AIR PLENUM SHALL BE RATED AND APPROVED FOR INSTALLATION IN A RETURN AIR PLENUM.





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HARRIS COUNTY APPRAISAL DISTRICT

13013 NORTHWEST FREEWAY HOUSTON, TX 77040

LEVEL 1

MECHANICAL KEYED NOTES:

- 1 PROVIDE NEW 24" X 24" SUPPLY AIR DEVICE AT LOCATION INDICATED. BALANCE TO CFM INDICATED. SEE SCHEDULE AND DETAILS. TYPICAL.
- PROVIDE NEW 24" X 24" RETURN AIR GRILLE AT LOCATION INDICATED. SEE SCHEDULE AND DETAILS. TYPICAL
- 3 EXISTING <u>DUAL DUCT BOX</u> TO REMAIN. CLEAN AND REPAIR TO GOOD WORKING CONDITION. REPAIR IF DAMAGED. NOTIFY OWNER AND ARCHITECT IF UNIT CANNOT BE REPAIRED. TYPICAL.
- (4) DEMOLISH EXISTING SUPPLY/RETURN AIR DEVICE.TYPICAL.
- 5 INSURE TAP FROM EXISTING DUCT TO NEW SUPPLY DEVICES HAS CORRECT NECK SIZE. SEE SCHEDULE AND DETAILS. TYPICAL.
- RELOCATE EXISTING THERMOSTAT TO LOCATION INDICATED. COORDINATE EXACT LOCATION WITH ARCHITECT. CLEAN AND REPAIR TO GOOD WORKING CONDITION. CONTRACTOR TO FIELD VERIFY FOR EXACT THERMOSTAT. REPAIR OR REPLACE IF DAMAGED. CLEAN AND RE-CALIBRATE TO APPEAR IN LIKE NEW CONDITION. TYPICAL.





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MECHANICAL PLAN

TM1.01

AIR DEVICE SCHEDULE							
MARK	MANUF. + MODEL	TYPE	REMARKS				
X	TITUS PCS OR EQUAL	CEILING SUPPLY	24x24 PERFORATED FACE. FACE SHALL BE ALUMINUM WITH A STEEL BACK PAN. PROVIDE AIR PATTERN CONTROLS. FACE AND FRAME SHALL HAVE AN OFF-WHITE ENAMEL FINISH. BACK PAN INTERIOR SHALL BE PAINTED FLAT BLACK. COORDINATE CEILING MOUNTING TYPE WITH ARCHITECTURAL CEILING TYPE. PROVIDE REMOTE DAMPER OPERATORS IN AREAS WITH INACCESSIBLE CEILINGS.				
	TITUS PAR OR EQUAL	CEILING RETURN	24x24 PERFORATED FACE. FACE SHALL BE ALUMINUM WITH A STEEL BACK PAN. FACE AND FRAME SHALL HAVE AN OFF— WHITE ENAMEL FINISH. COORDINATE CEILING MOUNTING TYPE WITH ARCHITECTURAL CEILING TYPE.				

DIFFUSER NECK SIZE SCHEDULE

CFM RANGE	SQUARE NECK SIZE	ROUND NECK SIZE
0 - 120	6 X 6	6 " ø
125 – 220	8 X 8	8"ø
225 - 330	10 X 10	10 " ø
335 - 450	12 X 12	12 " ø
455 - 530	15 X 15	14 " ø
540 - 700	16 X 16	16 " ø

OUTSIDE AIR ANALYSIS

OUTSIDE AIR SHALL BE PROVIDED IN ACCORDANCE WITH THE 2012 INTERNATIONAL MECHANICAL CODE

x Pz + (Ra x Az) = VbzCONFERENCE/OFFICE: $(5 \text{ CFM/PER } \times 8 \text{ PPL}) + (0.06 \text{ CFM/SQFT } \times 1279 \text{ SQFT}) = 117 \text{ CFM}$ CORRIDOR: $(- \text{ CFM/PER } \times - \text{ PPL}) + (0.06 \text{ CFM/SQFT } \times 229 \text{ SQFT}) = 14 \text{ CFM}$

TOTAL	= 131 CFM
OVERALL: Vbz / Ez 131 CFM / 1	= Voz = 131 CFM
TOTAL OUTSIDE AIR REQUIRED	= 131 CFM
TOTAL OUTSIDE AIR PROVIDED	= 135 CFM

SPIN-IN WITH VOLUME SUPPLY DUCT WITH INSULATED FLEXIBLE DUCT. DAMPER. EXTERNAL INSULATION. 8'-0" MAXIMUM LENGTH. WHERE LONGER RUNS ARE REQUIRED PROVIDE RIDGID ROUND DUCT. FLEX DUCT SIZE SHALL MATCH NECK SIZE. I SEAL TAP WITH HARD CAST AT CONNECTION. STAINLESS STEEL WORM DRIVE CLAMP ON LINER. OUTER JACKET SHALL BE SECURED. WITH VAPOR BARRIER TAPE. REMOTE REGULATOR WHERE REQUIRED.

- CEILING DIFFUSER SHALL BE INSTALLED SUCH THAT THE FACE OF DIFFUSER IS FLUSH WITH CEILING. REFER TO AIR DEVICE SCHEDULE FOR EXACT DEVICE.
- 2. SUPPORT FLEXIBLE DUCT FROM STRUCTURE. FLEXIBLE DUCT SHALL NOT KINK, SAG OR REST ON LIGHT FIXTURE, CEILING SUPPORT "TEES" OR CEILING TILE.
- 3. PROVIDE SQUARE TO ROUND TAP AT BRANCH DUCT WHERE FLEXIBLE DUCT SIZE EXCEEDS DIMENSION OF RECTANGULAR DUCT.
- 4. FOR UNCONDITIONED CEILING PLENUMS, INSULATE BACK OF CEILING DIFFUSER WITH 1" DUCT WRAP AND SEAL WITH VAPOR BARRIER TAPE.
- 5. METALLIC FLEXIBLE DUCT SHALL BE USED WHERE FLEXIBLE DUCT CONNECTIONS ARE SHOWN ON THE DRAWING TO ALL AIR DEVICES INSTALLED IN INACCESSIBLE LOCATIONS SUCH AS ABOVE GYPSUM BOARD OR PLASTER CEILINGS. (REFER TO ARCH. DRAWINGS FOR CEILING TYPE.)
- 6. CEILING "TEE" OR DRYWALL TRIM PIECE BY OTHERS.





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LEVEL 1

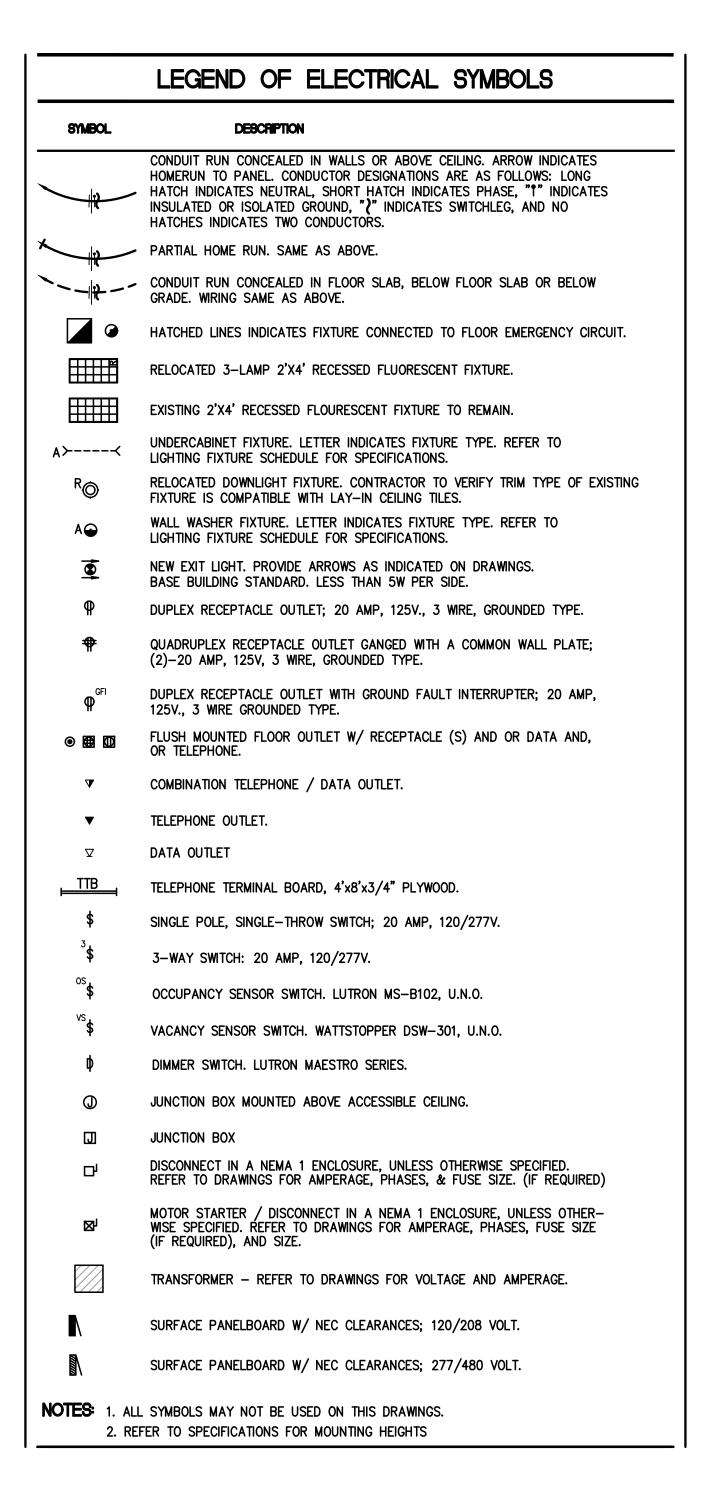




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MECHANICAL DETAILS

TM2.01



ELECTRICAL LIGHTING GENERAL NOTES:

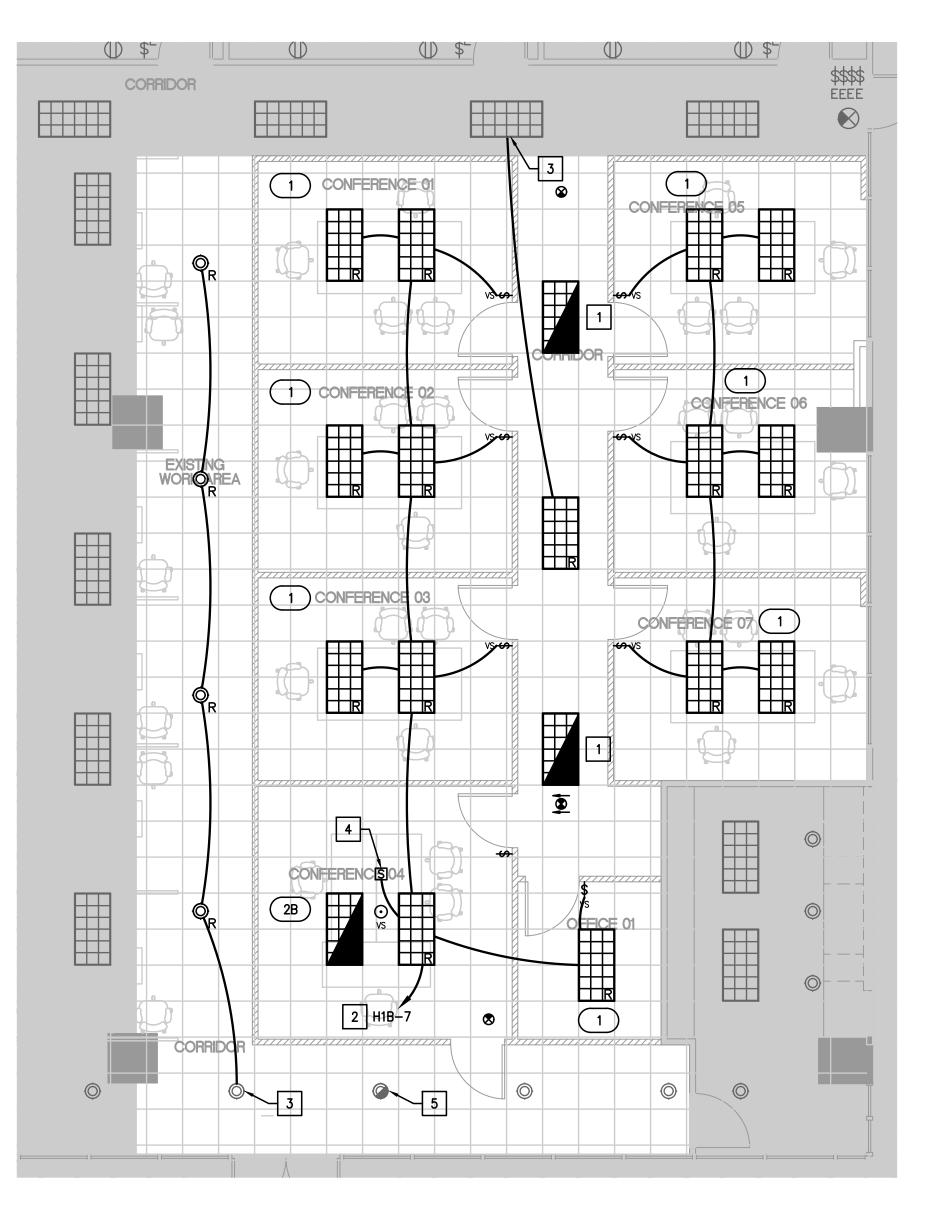
- . MEP SPECIFICATIONS SHALL APPLY TO ALL WORK SHOWN ON THIS DRAWING UNLESS OTHERWISE NOTED.
- 2. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLAN FOR THE EXACT LOCATION OF ALL LIGHTING FIXTURES.
- 3. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL JUNCTION BOXES IN THE JUNCTION BOX GRID AND AVAILABILITY OF ALL CIRCUITS INDICATED TO BE USED.
- 4. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING EQUIPMENT PRIOR TO CONSTRUCTION. PROVIDE CIRCUIT TRACING AS REQUIRED TO DETERMINE CIRCUIT AVAILABILITY. PROVIDE A WRITTEN REPORT TO ENGINEER AND BUILDING MANAGEMENT SHOWING LIGHTING LOCATIONS AND CIRCUIT NUMBER USED.
- 5. ALL UNUSED WIRING IS TO BE REMOVED BACK TO SOURCE UNLESS NOTED OTHERWISE.
- 6. EGRESS AND EXIT LIGHT FIXTURES SHALL BE CONNECTED TO FLOOR EMERGENCY CIRCUIT WITH 2#10,1/2"C.
- 7. ALL LIGHTS SHALL BE CLEANED AND RESTORED TO GOOD WORKING CONDITION. PROVIDE NEW FIXTURES TO MATCH EXISTING AS REQUIRED. RELAMP ALL FIXTURES WITH NEW LAMPS AS REQUIRED.
- 8. CONTRACTOR SHALL REFER TO BUILDING MANAGEMENT'S "RULES AND REGULATIONS" TO COMPLY WITH BUILDING STANDARDS.
- FOR RETURN AIR PLENUMS, ALL MATERIALS LOCATED WITHIN A RETURN AIR PLENUM SHALL BE RATED AND APPROVED FOR INSTALLATION IN A RETURN AIR PLENUM.

ELECTRICAL LIGHTING KEYED NOTES:

- 1 CONNECT RELOCATED CORRIDOR LIGHTS TO EXISTING EMERGENCY LIGHTING CIRCUIT TO ACT AS UNSWITCHED EMERGENCY LIGHT.
- RECIRCUIT RELOCATED LIGHTS TO EXISTING CIRCUIT LOCATED ABOVE THE CEILING IN THIS AREA. CONTRACTOR TO VERIFY LOAD DOES NOT EXCEED 4000VA PER 20A, 277V CIRCUIT.
- CIRCUIT AND CONTROL RELOCATED CORRIDOR LIGHTS WITH EXISTING CORRIDOR LIGHTS AS INDICATED. CONTRACTOR TO VERIFY LOAD DOES NOT EXCEED 4000VA PER 20A, 277V CIRCUIT.
- PROVIDE ISOLITE ELCD 924 ABOVE CEILING FOR ON/OFF CONTROL OF EMERGENCY FIXTURE IN ROOM. DURING NORMAL OPERATION THE RELAY POWER PACK WILL OPERATE BOTH FIXTURES. UPON LOSS OF POWER, THE DEVICE WILL ALLOW EMERGENCY FIXTURE TO TURN ON TO ACT AS EGRESS FIXTURE.
- 5 CONTRACTOR TO VERIFY EXISTING EGRESS LIGHTING IN CORRIDOR AND PROVIDE NEW IF NECESSARY. CONNECT EXISTING DOWNLIGHT TO FLOOR EMERGENCY CIRCUIT IF NEEDED.

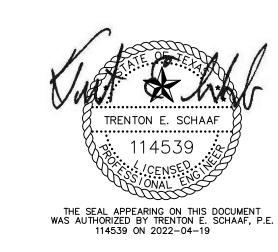
!!!!ATTENTION PLAN EXAMINER!!!!!

THIS PROJECT IS EXEMPT FROM PROVIDING DAYLIGHT RESPONSE CONTROLS PER IECC 2015 SECTION C405.2.3. ALL EXTERIOR SPACES HAVE LESS THAN 150 WATTS OF GENERAL LIGHTING WITHIN THE DAYLIGHT ZONE.



	LIGHTING CONTROL SCHEDULE									
MARK	CONTROL DESCRIPTION	CONTROL DEVICES	SEQUENCE OF OPERATION							
1	WALL MOUNTED VACANCY SENSING	MS-B102 (DUAL-TECHNOLOGY WALL VACANCY SENSOR)	LIGHT FIXTURES IN THIS ROOM ARE TO BE MANUAL-ON/AUTO-OFF CONTROLLED BY THE WALL MOUNTED VACANCY SENSOR SWITCH.							
	CEILING MOUNTED VACANCY SENSING	PJ2-2B-GXX-L01 (WIRELESS REMOTE SWITCH) LRF2-OCR2B-P (WIRELESS CEILING VACANCY SENSOR) RMJS-16R-DV-B (RELAY POWER PACK WITH WIRELESS RECEIVER)	LIGHT FIXTURES IN THIS ROOM ARE TO BE MANUAL-ON/ AUTO-OFF CONTROLLED BY THE RELAY POWER PACK WITH WIRELESS RECEIVER; RECEIVING INPUTS FROM THE WIRELESS CEILING MOUNTED VACANCY SENSOR & THE WIRELESS REMOTE SWITCH.							

THIS CONTROL SCHEDULE IS INTENDED TO PROVIDE GENERAL LIGHTING CONTROL DEVICE QUALITY AND PERFORMANCE REQUIREMENTS ONLY. CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN THE EXACT MODEL/CATALOG NUMBER OF THE LIGHTING CONTROL DEVICES LISTED ABOVE. THIS LIGHTING CONTROL DESIGN IS BASED ON LUTRON LIGHTING CONTROL DEVICES, CONTRACTOR MUST SUBMIT ANY SUBSTITUTION OF AN APPROVED MANUFACTURER TO THE ENGINEER FOR REVIEW.



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1 04/19/22 ISSUE FOR BID/PERMIT

HARRIS COUNTY APPRAISAL DISTRICT

13013 NORTHWEST FREEWAY HOUSTON, TX 77040

LEVEL 1

Mechanical Electrical Electrical Plumbing

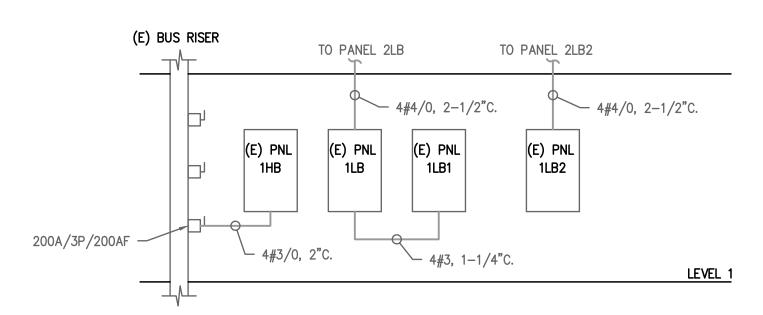
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ELECTRICAL LIGHTING PLAN

TE1.01



A NEL:	-	1HB	-	VIOTINIO D	A A IEI									
				XISTING P				10			1.005000DIF0			
OLTAC	jE:	277/480V,	, 3PH, 4VV	BUS:	225 AMP		II AM	NS:	M.L.	J.	ACCESSORIES:			
ODES:		0-LIGHTS	1-DECED 2-E	JI IID 3-1/10	1-HTC 5-	125% 0	A TOS	/ITD	6-KI	TCHEN :	7=PREVIOUSLY CALCULATED			
ODES.	LOAD		ESCRIPTION	301F 3-A/C	74-1110 0-	BKR					CIRCUIT DESCRIPTION		LOAD	COD
0			- ROOM 108		*	20/1	1	A	2		LIGHTING - ROOM 105	*	2000	
ŏ			- ROOM 109		*	20/1	3	В	4		CORRIDOR DOWNLIGHTS	*	1000	
o l			- ROOM 103	1	*	20/1	5	c	6		LIGHTING - ROOM 106	*	2000	
ŏ		LOBBY LI		•	*	20/1	7	Ă	8		MECH ROOM LIGHTING	*	500	
١		ISPARE	Citino		**	20/1	9	В	10		ISPARE	**	300	
		SPARE			**	20/1	11	C	12		RESTROOM LIGHTING	*	1000	0
		AHU-1B			*	70/3	13	A	14		ISPARE	**	1000	
		A110-1B			*	70/3	15	В	16	20/3	SPAIL	**		
					*	-	17		18	_		**		
0	2000	LIGHTING			*	20/1	19		20	_	SPACE	***		
0		SPACE			***	20/1	21	В	22		ISPACE	***		
		SPACE			***		23		24			***		
		SPACE					23	IЧ	24		SPACE			
	LIGHTS	RECEP.		MOTORS	EL. HEAT	PHASE				PHASE	CONN.KVA LOAD FACTORS		DES. AMP	
	7500	1	이	0	0	Α				Α	7.5 LIGHTS @ 125%	9.4	34	
	3000		이	0	0	В				В	3.0 EQUIP. @ 100%	3.8	14	
	5000		0 0	0	0	С				С	5.0 LG. MOTOR @125%	6.3	23	
	15500	(0	0	0	TOTAL				TOTAL	15.5 RECEPS @ 10kW+50	% 19.4	23	

- * EXISTING CIRCUIT BREAKER ESTIMATED LOAD EXISTING SPARE CIRCUIT BREAKER
- *** EXISTING BREAKER SPACE **** REPLACE EXISTING BREAKER AS SHOWN

PANEL:	CT NUMBER	1LB2					105			I EVICTII	NG 75kVA XFMR				
/OLTA		120/208V, 3	3DH 1/M		: 225 AMP	NG PANE			M.L.		ACCESSORIES:				
OLIA	OL.	120/2004, 3	Ji i i, 4vv	ВОО	. 220 AIVII		IVIZ	IVO.	IVI. ∟. \	J .	ACCESSORIES.				
CODES:		0=LIGHTS 1	=RECEP	2=EQUIP 3=A.	/C 4=HTG 5=						7=PREVIOUSLY CALCUL	_ATED			_
CODE	LOAD	CIRCUIT DE	SCRIPTIC	N		BKR	CKT	PH		BKR	CIRCUIT DESCRIPTION			LOAD	CO
1	720	WORKSTA ⁻	TIONS - F	ROOM 176-85	*	20/1	1	Α	2	20/1	PC CIRCUIT - ROOM 10		*	720	
1				ROOM 176-85	*	20/1	3	В	4	20/1	PC CIRCUIT - ROOM 11:	2,13,15,16	*	720	1
1	720	WORKSTA ⁻	TIONS - F	ROOM 176-85	*	20/1	5	C	6	20/1	PC CIRCUIT - ROOM 11	8,21,22,23	*	720	-
1	720	WORKSTA ⁻	TIONS - F	ROOM 166-75	*	20/1	7	Α	8	20/1	PC CIRCUIT - ROOM 12	5,27,28,30	*	720	-
1	720	WORKSTA ⁻	TIONS - F	ROOM 166-75	*	20/1	9	В	10	20/1	PC CIRCUIT - ROOM 13	1,36	*	720	1
1	720	WORKSTA ⁻	TIONS - F	ROOM 166-75	*	20/1	11	C	12	20/1	PC CIRCUIT - ROOM 13	6	*	720	1
1	720	WORKSTA ⁻	TIONS - F	ROOM 156-65	*	20/1	13	Α	14	20/1	MEETING ROOM RECEP	S	*	1440	1
1	720	WORKSTA ⁻	TIONS - F	ROOM 156-65	*	20/1	15		16	20/1	MEETING ROOM RECEP	S	*	1440	-
1	720	WORKSTA ⁻	TIONS - F	ROOM 156-65	*	20/1	17	C	18	20/1	MEETING ROOM RECEP	S	*	1440	-
1	1260	CONFEREN	CE ROOM	VI RECEPS	**	20/1	19	Α	20	20/1	MEETING ROOM RECEP	S	*	1440	1
1	540	OFFICED RE	ECEPS		**	20/1	21	В	22	20/1	MEETING ROOM RECEP	S	*	1440	1
1	1260	CONFEREN	CE ROOM	M RECEPS	**	20/1	23	C	24	20/1	MEETING ROOM RECEP	S	*	1440	1
1	1260	CONFEREN	CE ROOM	VI RECEPS	**	20/1	25	Α	26	20/1	MEETING ROOM RECER	S	*	1440	1
1	1260	CONFEREN	CE ROOM	VI RECEPS	**	20/1	27	В	28	20/1	MEETING ROOM RECEP	S	*	1440	/
1		CONFEREN			**	20/1	29	C	30	20/1	SPARE		**		
1		CONFEREN			**	20/1	31	Ā	32		SPACE		***		
1		CONFEREN			**	20/1	33		34		SPACE		***		
1	720	WORKSTA ⁻	TIONS		*	20/1	35	C	36		SPACE		***		
		SPACE			***		37	Ā	38		SPACE		***		
		SPACE			***		39	В	40		SPACE		***		
		SPACE			***		41		42		SPACE		***		
	LIGHTS	RECEP.	EQUIP	. MOTORS	EL. HEAT	PHASE				PHASE	CONN.KVA LOAD FAC		DES. KVA	DES. AMP	
	0	11700		0 (0	Α	1			Α	11.7 LIGHTS @		7.5	63	
	0	10980		0 (0 0	В				В	11.0 EQUIP. @ 1		7.2	60	
	0	9720		0 (С				С	9.7 LG. MOTOF		6.5	54	
	0	32400 IRCUIT BREA		0 (0	TOTAL				TOTAL	32.4 RECEPS @	10kW+50%	21.2	59	

- *** EXISTING BREAKER SPACE

 **** REPLACE EXISTING BREAKER AS SHOWN

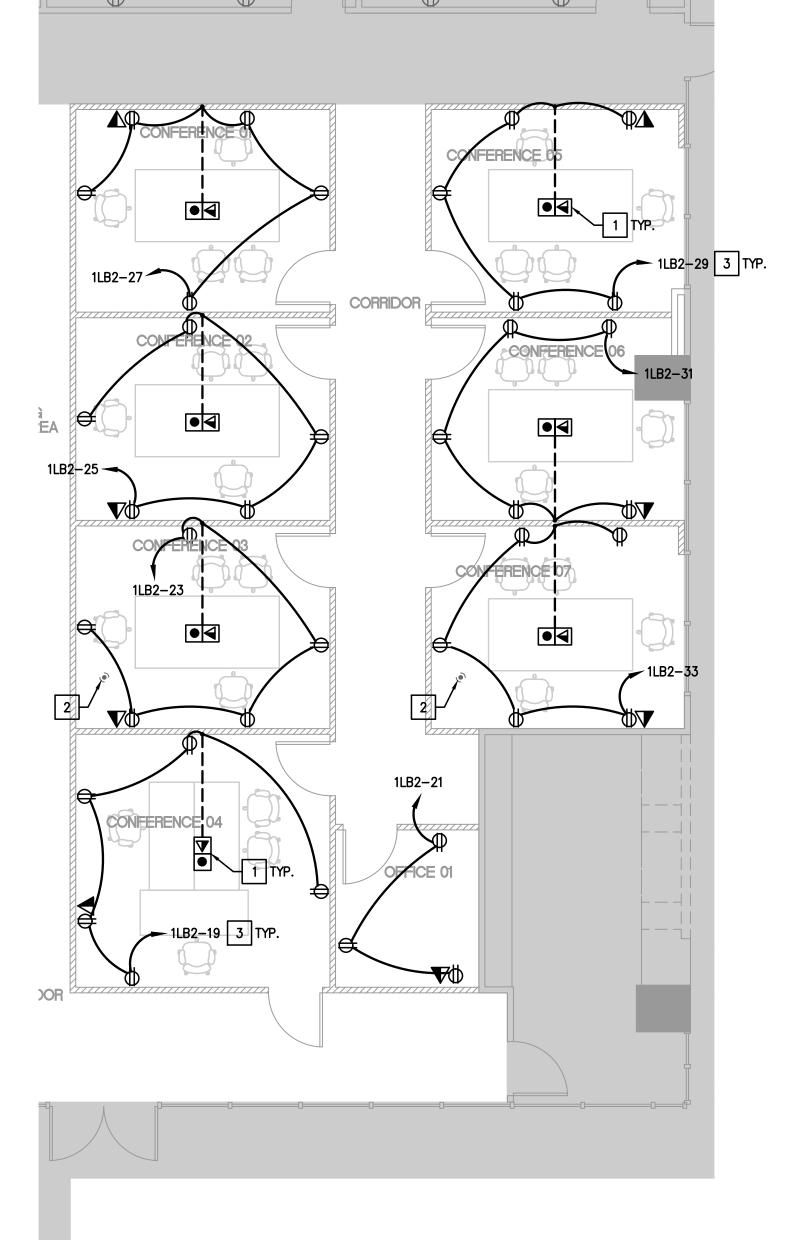
- **ELECTRICAL POWER GENERAL NOTES:**
- 1. MEP SPECIFICATIONS SHALL APPLY TO ALL WORK ON THIS DRAWING UNLESS OTHERWISE NOTED.
- 2. REFER TO ARCHITECT FOR EXACT HEIGHT AND LOCATION OF ALL FLOOR AND WALL OUTLETS.
- 3. ALL DATA/TELEPHONE OUTLETS SHALL BE PROVIDED WITH PULL STRINGS.
- 4. CONTRACTOR SHALL LOCATE ALL ELECTRICAL & TELEPHONE OUTLETS WITHIN THE LIMITS OF THE TENANT FURNITURE PLAN PROVIDED BY THE ARCHITECT. CONTRACTOR SHALL MARK INTENDED LOCATION OF ALL OUTLETS PRIOR TO INSTALLATION, THEN SHALL NOTIFY TENANT FOR APPROVAL
- 5. CONTRACTOR SHALL PROVIDE NEW CIRCUIT DIRECTORY CARD AT PANELS. CIRCUITS SHALL BE LABELED TO CORRESPOND TO THE CIRCUITS SHOWN ON THE DRAWINGS. CONTRACTOR SHALL CONNECT CIRCUITS AS REQUIRED TO COMPLY WITH THIS DRAWING.
- 6. CONDUCTORS SHALL BE #12 AWG SOLID COPPER (THWN) IN 1/2" CONDUIT UNLESS OTHERWISE
- 7. ALL OUTLETS TO BE MOUNTED VERTICALLY UNLESS OTHERWISE INDICATED.
- 8. CONTRACTOR SHALL PROVIDE ONE PULL STRING FOR EACH VOICE OR DATA OUTLET SHOWN. WHEN VOICE AND DATA OUTLETS ARE SHOWN ADJACENT, CONTRACTOR SHALL PROVIDE ONE PULL STRING (WITH ONE WALL PENETRATION) FOR THE PAIR, UNLESS NOTED OTHERWISE. VOICE AND DATA LINES SHALL BE PULLED BY OTHERS.
- 9. CONTRACTOR SHALL REFER TO BUILDING MANAGEMENT'S "RULES AND REGULATIONS" TO COMPLY
- 10. GANG TOGETHER, ALL NEW ELECTRICAL, TELEPHONE AND COMPUTER OUTLETS SHOWN ADJACENT TO
- 11. VERIFY FINAL LOCATIONS FOR ROUGH-INS WITH FIELD MEASUREMENTS AND WITH THE REQUIREMENTS OF THE ACTUAL EQUIPMENT TO BE CONNECTED.
- 12. COORDINATE THE INSTALLATION OF ELECTRICAL MATERIALS AND EQUIPMENT ABOVE CEILINGS WITH SUSPENSION SYSTEM, MECHANICAL EQUIPMENT AND SYSTEMS, AND STRUCTURAL COMPONENTS. COORDINATE ELECTRICAL EQUIPMENT AND MATERIALS INSTALLATION WITH OTHER BUILDING
- 13. VERIFY MECHANICAL EQUIPMENT SWITCH AND CONNECTION REQUIREMENTS, ITEM BY ITEM, WITH THE MECHANICAL CONTRACTOR, BEFORE WIRING EQUIPMENT. RESOLVE ALL DISCREPANCIES WITHOUT FURTHER COST TO OWNER.
- 14. FOR RETURN AIR PLENUMS, ALL MATERIALS LOCATED WITHIN A RETURN AIR PLENUM SHALL BE RATED AND APPROVED FOR INSTALLATION IN A RETURN AIR PLENUM.

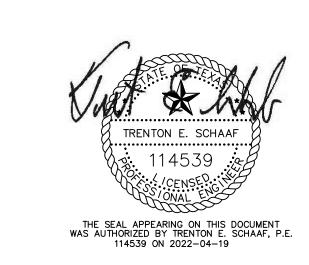
ELECTRICAL POWER KEYED NOTES:

- 1 PROVIDE WIREMOLD RPNFB ROUND IN-GRADE FLOOR BOX WITH RP4CTC COVER KIT FOR POWER AND VOICE/DATA SERVICE IN THE FLOOR. ROUTE 1" DATA CONDUIT UP WALL TO ABOVE CEILING.
- 2 DEMOLISH EXISTING FLOOR BOXES FOR POWER TO DEMOLISHED SYSTEMS FURNITURE. REUSE EXISTING CIRCUITS FOR POWER TO NEW MEETING ROOMS.
- CIRCUIT NEW MEETING ROOM TO CIRCUIT FROM DEMOLISHED SYSTEMS FURNITURE. CONTRACTOR TO VERIFY EXISTING CIRCUIT NUMBER AND UPDATE PANEL SCHEDULE

PROJECT NAME: PROJECT NUMBER:	HCAD ARB 22072.00	ROOMS			
SERVICE VOLTAGE:		277/480V, 3	BPHASE, 4 WR	E, WYE	
LOA D DESCRIPTION	CODE LOAD (kVA)	CONNECTEL LOAD (kVA)	DEMAND FACTORS (%)	DESIGN LOAD (kVA)	REWARKS
LIGHTS:		0.0	125%	0.0	NEC 220.12
SIGN LIGHTS:		0.0	125%	0.0	NEC 220.12
SITE LIGHTS:		0.0	125%	0.0	NEC 220.12
RECEPTA CLES:		9.4	10kVA+50%	9.4	NEC 220.K, 220.I, 220.44
EQUIPMENT:		0.0	100%	0.0	NEC 220.14.A
WATER HEATERS:		0.0	100%	0.0	NEC 220.14.A
HVAC:		0.0	100%	0.0	NEC 220.14.A
ELECTRIC HEAT:		0.0	100%	0.0	INHVAC
LARGEST MOTOR:		0.0	125%	0.0	NEC 430.22
		TOTAL DES		9 11	kVA AMPS

NOTE: ALL LOADS AND DEWAND FACTORS ARE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NEC ARTICLE 220





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HARRIS COUNTY **APPRAISAL**

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ELECTRICAL POWER PLAN

TE2.01

