FEDERAL WAY PUBLIC SCHOOLS

DECATUR HIGH SCHOOL WELDING AREA **MECHANICAL & ELECTRICAL WORK**

Project Address: 2800 SW 320th Street Federal Way, WA 98023

PERMIT/BID SET JANUARY 8, 2025

Owner:

Federal Way Public Schools Contact: Stephen Nutt - Project Manager Phone #: 253-945-5990 Email: snutt@fwps.org

Consultant:

BCE Engineers Contact: Dave Taylor - Project Manager dwtaylor@transystems.com Email: Michael Cozart - Principal in Charge mlcozart@transystems.com Email: Phone #: 253-922-0446

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GENERAL NOTES AND SCHEDULES

Description of Work: HVAC/Plumbing: New ventilation system for the welding area, including replacement of the existing downdraft exhaust fan with a new rooftop fan and exhaust point of use welding fume filters. The controls for the new exhaust fan will require integration into the existing building digital control system to operate on the school's schedule. Provide copper piping for the compressed air system. Compressed air piping will be extended from the existing system in the adjacent room.

Electrical: Provide new transformer and panel to serve the new welding area and equipment. The transformer to be served from existing distribution panel in the adjacent room. Provide connections to the welding booths and mechanical equipment.



Xref \ 515240317 E-BS tblock.dwa

MECHANICAL LEGEND							
	HVAC						
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION				
\boxtimes	SUPPLY DUCT UP		FLEXIBLE DUCT				
X	SUPPLY DUCT DOWN		VOLUME DAMPER (VD)				
	RETURN, RELIEF, TRANSFER, OSA DUCT UP		MOTORIZED DAMPER				
	RETURN, RELIEF, TRANSFER, OSA DUCT DOWN		CEILING RADIANT FIRE DAMPER				
\square	EXHAUST DUCT UP		FIRE DAMPER				
X	EXHAUST DUCT DOWN		COMBINATION FIRE/SMOKE DAMPER				
	RECTANGULAR DUCT SQUARE ELBOW UP		FLEXIBLE CONNECTION (DUCT)				
	RECTANGULAR DUCT, RADIUS ELBOW UP		TURNING VANES (TV)				
	RECTANGULAR DUCT, SQUARE ELBOW DOWN		BACKDRAFT DAMPER (BD)				
	RECTANGULAR DUCT, RADIUS ELBOW DOWN		THERMOSTAT (T'STAT)				
	ROUND DUCT ELBOW UP	POC	POINT OF CONNECTION				
CIT	ROUND DUCT ELBOW DOWN	BFF	BELOW FINISHED FLOOR				
\square	CEILING AIR TERMINAL - SQUARE	AFF	ABOVE FINISHED FLOOR				
		GC	GENERAL CONTRACTOR				
12 X 12 CD 300 CFM	AIR TERMINAL SIZE, TYPE & CFM	XØ	ROUND DUCT				
X/X	SQUARE DUCT	EC	ELECTRICAL CONTRACTOR				





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FEDERAL WAY PUBLIC SCHOOLS DECATUR HIGH SCHOOL WELDING AREA WELDING AREA 2800 S.W. 320TH STREET FEDERAL WAY, WA 98023 SYMBOLS LEGEND REVISIONS NO. DESCRIPTION DATE _____ _____ _____ _____ DRAWN BY: FM CHECKED BY: FM СТ PROJECT MANAGER: DRAWING No. of TOTAL M001

NOTICE:

THE FOLLOWING LIST OF SPECIFICATIONS AND DRAWINGS REPRESENTS THOSE DOCUMENTS THAT WERE PREPARED UNDER THE PROVISIONS OF THE REVISED CODE OF WASHINGTON RCW 18.43, BY BCE ENGINEERS, INC. OF TACOMA, WASHINGTON. THE SEALING OF THIS SPECIFICATION AND DRAWINGS LIST IS PROVIDED IN ACCORDANCE WITH WASHINGTON ADMINISTRATIVE CODE WAC196-23-020.

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SECTION DESCRIPTION

DIVISION 20 – MECHANICAL SPECIFICATIONS GENERAL MECHANICAL REQUIREMENTS 20 00 00

DIVISION 22 – PLUMBING 22 07 19 PLUMBING PIPING INSULATION 22 10 05 PLUMBING PIPING

END OF TABLE OF CONTENTS

SECTION 20 00 00 GENERAL MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.01 GENERAL

- A. INCLUDES, BUT NOT LIMITED TO, FURNISHING LABOR, MATERIALS, AND EQUIPMENT FOR COMPLETION OF WORK UNLESS INDICATED OR NOTED OTHERWISE. SEE DIVISION 1 FOR SEQUENCE OF WORK.
- B. WORK INDICATED ON THE MECHANICAL PLANS AND IN THE SPECIFICATIONS THAT WILL NOT BE PERFORMED BY THIS MECHANICAL CONTRACTOR (I.E. DUCT AND PIPE BLOCK-OUTS, PENETRATIONS THROUGH WALLS, FLOORS, AND ATTIC, WALL PATCHING, WORK INDICATED TO BE PERFORMED BY OTHER CONTRACTORS, ETC.) SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR PRIOR TO BID. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING QUANTITY, SIZE, AND TYPE OF WORK WITH THE GENERAL CONTRACTOR. WORK NOT COORDINATED WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR AND SHALL NOT BE CHARGED AS ADDITIONAL COST TO THE OWNER.
- C. ALL WORK INCLUDED IN DIVISION 22 SHALL BE THE RESPONSIBILITY OF A SINGLE MECHANICAL SUBCONTRACTOR.
- D. THIS CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS REQUIRED BY STATE AND LOCAL AUTHORITIES GOVERNING THE INSTALLATION OF THE MECHANICAL WORK. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT ALL UTILITY ORGANIZATIONS SERVING THE BUILDING, PRIOR TO BID, AND TO INCLUDE ALL CHARGES FOR INSPECTIONS, INSTALLATION OF MATERIALS, EQUIPMENT, AND CONNECTION OF ALL REQUIRED UTILITIES.
- E. THE DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY AND WHAT IS CALLED FOR IN EITHER IS BINDING AS IF CALLED FOR IN BOTH.
- 1.02 RELATED SECTIONS
- A. GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 APPLY TO THIS SECTION.
- 1.03 SUBMITTALS REQUIREMENTS OF THIS SECTION
- A. ACCESS DOORS.
- 1.04 QUALITY ASSURANCE
 - A. REQUIREMENTS OF REGULATORY AGENCIES:
 - 1. PERFORM WORK IN ACCORDANCE WITH APPLICABLE CODES.
 - 2. IN CASE OF DIFFERENCES BETWEEN BUILDING CODES, STATE LAWS, LOCAL ORDINANCES, UTILITY COMPANY REGULATIONS, AND CONTRACT DOCUMENTS, THE MOST STRINGENT SHALL GOVERN.
- B. PRODUCT APPROVALS: SEE PARAGRAPHS ELSEWHERE IN THIS SPECIFICATION.
- C. WARRANTIES:
 - 1. IN ADDITION TO GUARANTEE SPECIFIED IN GENERAL CONDITIONS PLUMBING SYSTEMS TO BE FREE FROM NOISE IN OPERATION THAT MAY DEVELOP FROM FAILURE TO CONSTRUCT SYSTEM IN ACCORDANCE WITH CONTRACT DOCUMENTS
- D. MANUFACTURE: USE DOMESTIC MADE PIPE AND PIPE FITTINGS ON PROJECT.
- 1.05 CODES AND STANDARDS
 - A. CODES AND AGENCIES HAVING JURISDICTIONAL AUTHORITY OVER MECHANICAL INSTALLATION.
 - 1. WASHINGTON STATE ENERGY CODE -- LATEST APPROVED EDITION
 - 2. INTERNATIONAL BUILDING CODE -- LATEST APPROVED EDITION
 - 3. INTERNATIONAL FIRE CODE LATEST APPROVED EDITION
 - 4. INTERNATIONAL MECHANICAL CODE -- LATEST APPROVED EDITION
 - 5. UNIFORM PLUMBING CODE -- LATEST APPROVED EDITION
 - 6. LOCAL SEWER AND WATER DISTRICT REQUIREMENTS
 - 7. STATE AND COUNTY DEPARTMENT OF HEALTH
 - 8. LOCAL FIRE MARSHAL
 - 9. PUGET SOUND AIR POLLUTION CONTROL
 - 10. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)
 - 11. WASHINGTON INDUSTRIAL SAFETY AND HEALTH ACT (WISHA)
 - 12. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
- 1.06 SYSTEMS DESCRIPTION
- B. SITE INSPECTION:
 - 1. EXAMINE PREMISES AND UNDERSTAND THE CONDITIONS WHICH MAY AFFECT PERFORMANCE OF WORK OF THIS DIVISION BEFORE SUBMITTING PROPOSALS FOR THIS WORK.
 - 2. NO SUBSEQUENT ALLOWANCE FOR TIME OR MONEY WILL BE CONSIDERED FOR ANY CONSEQUENCE RELATED TO FAILURE TO EXAMINE SITE CONDITIONS.
- 1.07 DESIGN DRAWINGS
 - A. MECHANICAL DRAWINGS ARE NOT SHOP DRAWINGS AND ARE INTENDED TO SHOW GENERAL ARRANGEMENT OF PIPING. FOLLOW AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND WORK OF OTHER TRADES WILL PERMIT.
- B. CONSIDER ARCHITECTURAL AND ELECTRICAL DRAWINGS PART OF THIS WORK IN SO FAR AS THESE DRAWINGS FURNISH INFORMATION RELATING TO DESIGN AND CONSTRUCTION OF BUILDING. ARCHITECTURAL DRAWINGS TAKE PRECEDENCE OVER MECHANICAL DRAWINGS.
- C. BECAUSE OF SMALL SCALE OF MECHANICAL DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, AND ACCESSORIES WHICH MAY BE REQUIRED. THE MECHANICAL CONTRACTOR SHALL INCLUDE IN THE BID A SUFFICIENT QUANTITY OF OFFSETS, FITTINGS, AND ACCESSORIES FOR THE SIZE OF THE PROJECT, BASED UPON THE CONTRACTOR'S EXPERIENCE, NECESSARY TO FACILITATE MECHANICAL UTILITY INSTALLATION. NO ADDITIONAL COSTS SHALL BE CHARGED FOR ADDITIONAL OFFSETS, FITTINGS, AND ACCESSORIES REQUIRED FOR INSTALLATION OF THE MECHANICAL UTILITIES SHOWN ON THE DESIGN DRAWINGS. INVESTIGATE STRUCTURAL AND

FINISH CONDITIONS AFFECTING THIS WORK AND ARRANGE WORK ACCORDINGLY. PROVIDING SUCH FITTINGS. VALVES, AND ACCESSORIES REQUIRED IN MEETING THE DESIGN CONDITIONS.

1.08 PRE-CONSTRUCTION COORDINATION MEETING

- A. THIS CONTRACTOR IS RESPONSIBLE TO PARTICIPATE IN COORDINATION MEETINGS WITH THE GENERAL CONTRACTOR. FIRE PROTECTION CONTRACTOR. AND OTHER SUBCONTRACTORS NEEDING TO COORDINATE SPECIAL REQUIREMENTS (SUCH AS ELECTRICAL CONTRACTOR, HVAC CONTRACTOR, PLUMBING CONTRACTOR, ETC.)
- COORDINATION MEETINGS SHALL CONSIDER ELEVATIONS, REQUIRED CLEARANCES, AND ROUTINGS OF ALL TRADES TO ASSURE THAT ALL TRADES CAN BE INSTALLED WITHOUT CONFLICT.
- C. THE OUTCOME OF THIS COORDINATION SHALL ALLOW EACH SYSTEM (MECHANICAL, FIRE PROTECTION, PLUMBING, ELECTRICAL, ETC.) TO BE INSTALLED WITHOUT FURTHER CONFLICTS FOR SPACE OR LOCATIONS.
- D. FAILURE TO COORDINATE WITH OTHER TRADES AND/OR EXISTING CONDITIONS THAT RESULT IN THE REMOVAL AND RE-INSTALLATION OF SYSTEMS SHALL NOT BE CHARGED AS ADDITIONAL COSTS.

1.09 PRODUCT HANDLING AND PROTECTION

- A. CONTRACTOR IS RESPONSIBLE FOR PROTECTION OF ALL MATERIAL, EQUIPMENT AND APPARATUS PROVIDED UNDER THIS SECTION FROM DAMAGE, WATER, CORROSION, FREEZING AND DUST, BOTH IN STORAGE AND WHEN INSTALLED, UNTIL FINAL PROJECT ACCEPTANCE.
- PROVIDE TEMPORARY HEATED AND SHELTERED STORAGE FACILITIES FOR MATERIAL AND EQUIPMENT. B.
- HANDLE AND PROTECT EQUIPMENT AND/OR MATERIAL IN MANNER PRECLUDING UNNECESSARY FIRE HAZARD.
- D. MATERIAL OR EQUIPMENT DAMAGED BECAUSE OF IMPROPER STORAGE OR PROTECTION WILL BE REJECTED.
- E. EQUIPMENT FINISH THAT IS DAMAGED BY HANDLING, STORAGE, ETC. SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

1.10 DEFINITIONS

- A. FINISHED SPACES: SPACES USED FOR HABITATION OR OCCUPANCY WHERE ROUGH SURFACES ARE PLASTERED, PANELED, OR OTHERWISE TREATED TO PROVIDE A PLEASING APPEARANCE.
- B. UNFINISHED SPACES: SPACES USED FOR STORAGE OR WORK AREAS, SUCH AS FAN ROOMS, MECHANICAL ROOMS, ETC., WHERE APPEARANCE IS NOT A FACTOR.
- CONCEALED SPACES: SPACES OUT OF SIGHT. FOR EXAMPLE, ABOVE CEILINGS; BELOW FLOORS; BETWEEN DOUBLE WALLS; FURRED-IN AREAS; PIPE AND DUCT SHAFTS; AND SIMILAR SPACES.
- D. EXPOSED: OPEN TO VIEW. FOR EXAMPLE, PIPE RUNNING THROUGH A ROOM AND NOT COVERED BY OTHER CONSTRUCTION.
- OUTSIDE: OPEN TO VIEW UP TO 5 FEET BEYOND THE EXTERIOR SIDE OF WALLS, ABOVE THE ROOF, AND UNEXCAVATED OR CRAWL SPACES.
- CONDITIONED SPACE: AN AREA, ROOM, OR SPACE NORMALLY OCCUPIED AND BEING HEATED OR COOLED FOR HUMAN HABITATION BY ANY EQUIPMENT AS DEFINED BY THE EXTENT OF THE BUILDING ENVELOPE INSULATION.
- REPLACE: EXISTING MECHANICAL EQUIPMENT AND COMPONENTS SHALL BE DEMOLISHED AND DISCARDED FROM THE PROJECT SITE OR AS DIRECTED OTHERWISE. NEW MECHANICAL EQUIPMENT AND COMPONENTS SHALL BE INSTALLED IN THE AREA WHERE THE EXISTING MECHANICAL EQUIPMENT AND COMPONENTS WERE DEMOLISHED OR AS INDICATED ON THE CONTRACT DOCUMENTS.
- H. REMOVED: EXISTING MECHANICAL EQUIPMENT AND COMPONENTS IDENTIFIED ON THE CONTRACT DOCUMENTS SHALL BE TAKEN APART, TAKEN DOWN, AND DISCARDED FROM THE PROJECT SITE UNLESS DIRECTED OTHERWISE ON PLAN. REMOVED ITEMS SHALL NOT BE BROUGHT BACK TO THE PROJECT SITE FOR USE OR REINSTALLATION.
- REINSTALL: EXISTING MECHANICAL EQUIPMENT AND COMPONENTS IDENTIFIED ON THE CONTRACT DOCUMENTS THAT NEED TO BE TAKEN DOWN AND INSTALLED IN THE SAME OR NEW LOCATION.
- 1.11 ABBREVIATIONS
 - ADA AMERICANS WITH DISABILITIES ACT
- B. A/E ARCHITECT/ENGINEER
- C. AFF ABOVE FINISH FLOOR
- D. ANSI AMERICAN NATIONAL STANDARDS INSTITUTE
- APWAAMERICAN PUBLIC WORKS ASSOCIATION
- ASTM AMERICAN SOCIETY OF TESTING & MATERIALS
- G. BFF BELOW FINISH FLOOR
- H. FCO FLUSH CLEANOUT
- IAPMO INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS
- MSS MANUFACTURERS STANDARDIZATION SOCIETY
- K. PDI PLUMBING AND DRAINAGE INSTITUTE
- L. PER IN ACCORDANCE WITH
- M. POC POINT OF CONNECTION
- N. UL UNDERWRITER'S LABORATORIES
- O. VTR VENT THRU ROOF
- P. ADDITIONAL ABBREVIATIONS ARE AS LISTED ON THE DRAWINGS OR ELSEWHERE IN THESE SPECIFICATIONS.
- 1.12 SUBMITTAL PROCEDURES
- A. ALL MATERIAL USED ON THE PROJECT SHALL BE NEW AND FREE OF DEFECTS. THE ARCHITECT AND/OR ENGINEER RESERVE THE RIGHT TO REJECT ANY MATERIAL, THE APPEARANCE OF WHICH HAS BEEN DAMAGED ON THE SITE OR IN SHIPMENT. THE MATERIAL SHALL BE OF PRE-APPROVED EQUAL QUALITY TO THAT WHICH IS SPECIFIED. SHOULD THE MAKE AND TYPE OF MATERIAL DIFFER FROM THAT SPECIFIED, THE CONTRACTOR MAY BE REQUIRED TO SUBMIT CATALOG AND ENGINEERING DATA (SAMPLES IF REQUESTED) NECESSARY TO MAKE A COMPARISON AND DETERMINE ITS SUITABILITY. THE CONTRACTOR SHALL ALSO BEAR THE COST OF ALL CHANGES TO ANY ASPECT OF THE PROJECT (ELECTRICAL, MECHANICAL, BUILDING, ETC.) MADE NECESSARY BY ANY APPROVED SUBSTITUTIONS. APPROVED SUBSTITUTIONS INCLUDE THOSE LISTED AS APPROVED MANUFACTURERS OR APPROVED SUBSTITUTIONS. TENTATIVE APPROVAL OF SUBSTITUTE MATERIAL AND EQUIPMENT WILL BE MADE PRIOR TO BID ONLY. SUCH REQUEST FOR APPROVAL SHALL BE MADE TWO WEEKS IN ADVANCE OF THE BID OPENING TO ALLOW TIME TO ASSESS ITS SUITABILITY. FAILURE TO OBTAIN APPROVAL PRIOR TO BID SHALL REQUIRE THE SUCCESSFUL BIDDER TO FURNISH MATERIALS AND EQUIPMENT ONLY AS SPECIFIED HEREIN (SEE PARAGRAPH 2.01, THIS SPECIFICATION).
- EQUIPMENT SUBMITTALS SHALL BE SUBMITTED PER ONE OF THE FOLLOWING PROCESSES AS SELECTED BY THE ARCHITECT/ENGINEER REPRESENTATIVE AND/OR OWNER:
 - ELECTRONIC SUBMITTAL PROCESS:
 - a. THE CONTRACTOR SHALL UPLOAD ONE COMPLETE PDF FILE OF THE ELECTRONIC SUBMITTAL PACKAGE TO THE ARCHITECT'S SHAREPOINT SITE FOR APPROVAL. THE ELECTRONIC SUBMITTAL PACKAGE SHALL INCLUDE THE FOLLOWING:
 - 1) ALL REQUIRED SUBMITTALS (I.E. EQUIPMENT CUT SHEETS, SHOP DRAWINGS, ETC.) PER EACH SPECIFICATION SECTION.

- SUBMITTED. 1.13 WARRANTY
- 1.14 AS-BUILT DRAWINGS

 - CONTRACTOR REVISIONS.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

- COMPETITION.
- REQUIRE PRIOR APPROVAL.
- CONSULTANT'S APPROVAL PRIOR TO BID OPENING.
- SPECIFICATIONS.

- 2.02 ACCESS DOORS
 - ACCESSIBLE THROUGH SAME.

 - NON-PAINTED SURFACES (I.E. TILE, MDF)
 - C. APPROVED MANUFACTURERS 1. MILCOR
 - 2. ACUDOR
 - 3. GREENHECK

 - 4. NYSTROM
 - 5. MIFAB

2) TABLE OF CONTENTS IDENTIFYING EACH SPECIFICATION SECTION, SUBMITTAL REQUIREMENT OF EACH SPECIFICATION, AND THE MANUFACTURER NAME AND MODEL NUMBER OF EACH ITEM

INDEX SHEET FOR EACH SPECIFICATION SECTION.

SUBMISSION OF PDF FILES OF INDIVIDUAL SPECIFICATIONS OR EQUIPMENT CUTS WILL BE AUTOMATICALLY REJECTED.

THE CONTRACTOR SHALL COMPLETE AND UPLOAD A SUBMITTAL INFORMATION FORM, IN MICROSOFT WORD FORMAT, FOR THE A/E TEAM TO REVIEW. THE EQUIPMENT SUBMITTAL WILL NOT BE CONSIDERED "RECEIVED" NOR WILL A REVIEW BE PROVIDED UNTIL BOTH THE ELECTRONIC SUBMITTAL PACKAGE AND SUBMITTAL INFORMATION FORM HAVE BEEN UPLOADED.

6) IF THE ELECTRONIC SUBMITTAL PROCESS IS NOT FEASIBLE FOR A PARTICULAR SUBMITTAL SECTION (I.E. SAMPLES, CERTAIN SHOP DRAWINGS, RECORDED VIDEOS, CD'S, ETC.), THE CONTRACTOR SHALL SUBMIT A REQUEST IN WRITING TO THE A/E REPRESENTATIVE TO DEVIATE FROM THE ELECTRONIC SUBMITTAL PROCESS. IF ACCEPTABLE BY THE A/E REPRESENTATIVE THE CONTRACTOR SHALL FOLLOW THE HARD COPY SUBMITTAL PROCESS FOR THE SUBMISSION

a. ALL WARRANTIES FOR PLUMBING EQUIPMENT SHALL START UPON TURNOVER TO OWNER.

A. THE CONTRACTOR SHALL MAINTAIN. IN ADDITION TO COORDINATION DRAWINGS. AN AS-BUILT SET OF PRINTS THAT CLEARLY IDENTIFY ALL DEVIATIONS FROM THE ORIGINAL DESIGN. THE AS-BUILT DRAWINGS SHALL BE DRAFTED PER ONE OF THE FOLLOWING METHODS:

1. DRAFT ALL REVISIONS ON A SEPARATE DARK LAYER, ON THE COORDINATION DRAWING SET. THE CONTRACTOR SHALL MAINTAIN A COPY OF THE ORIGINAL COORDINATION DRAWING SET.

DRAFT ALL REVISIONS ON THE DESIGN DRAWINGS WITH A RED COLOR PENCIL.

THIS RED LINED SET SHALL IDENTIFY ALL DRAWING REVISIONS INCLUDING ADDENDA ITEMS, CHANGE ORDERS, AND

C. DRAWINGS SHALL SHOW LOCATIONS OF ALL UNDERGROUND PIPE AND DUCT INSTALLED BY THIS CONTRACTOR. UNDERGROUND PIPES AND DUCTS SHALL BE SHOWN WITH CROSS SECTION ELEVATIONS. ALL PIPE, RACEWAY, MANHOLES, OR LINES OF OTHER TRADES SHALL BE INCLUDED.

D. THE CONTRACTOR SHALL UPDATE ALL REFERENCES TO SPECIFIC PRODUCTS TO INDICATE PRODUCTS ACTUALLY INSTALLED ON PROJECT. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, AIR HANDLERS, HEAT PUMPS ETC.

1. UPON COMPLETION OF THE DIVISION 22 AND 23 WORK, THE CONTRACTOR SHALL DELIVER THE RED LINED DRAWINGS AND ONE SET OF NEATLY DRAFTED AS-BUILT DRAWINGS ON ELECTRONIC MEDIA IN ACAD 2015 FORMAT AND PDF FILES TO THE ENGINEER FOR TRANSMITTAL THROUGH THE ENGINEER TO THE OWNER

A. ANY REFERENCE TO THE SPECIFICATIONS OR ON THE DRAWINGS TO ANY ARTICLE, DEVICE, PRODUCT, MATERIAL FIXTURE, FORM, OR TYPE OF CONSTRUCTION BY MANUFACTURER, NAME, MAKE, OR CATALOG NUMBER SHALL BE INTERPRETED AS ESTABLISHING A STANDARD OF QUALITY AND SHALL NOT BE CONSTRUED AS LIMITING

B. THE MANUFACTURERS LISTED AS APPROVED MANUFACTURERS ARE APPROVED TO BID THE PROJECT FOR THE ITEMS INDICATED WITHOUT OBTAINING PRIOR APPROVAL. OTHER MANUFACTURERS DESIRING TO BID THE PROJECT

C. THE LISTING OF A MANUFACTURER AS AN APPROVED MANUFACTURER DOES NOT NECESSARILY MEAN THAT THE PRODUCTS OF THAT MANUFACTURER ARE EQUAL TO THOSE SPECIFIED. THE LISTING IS ONLY AN INDICATION OF THOSE MANUFACTURERS WHICH MAY BE CAPABLE OF MANUFACTURING, OR HAVE IN THE PAST MANUFACTURED, ITEMS EQUAL TO THOSE SPECIFIED, AND IS INTENDED TO AID THE CONTRACTOR IN IDENTIFYING MANUFACTURERS.

D. PRODUCTS PROVIDED BY APPROVED MANUFACTURERS SHALL BE EQUAL TO OR SUPERIOR TO THE SPECIFIED MANUFACTURER'S ITEM IN FUNCTION, APPEARANCE, AND QUALITY, AND SHALL FULFILL ALL REQUIREMENTS OF THE PLANS AND SPECIFICATIONS. THE ARCHITECT/ENGINEER SHALL BE THE FINAL JUDGE AS TO WHETHER AN ITEM MEETS THESE REQUIREMENTS OR NOT. IF A MANUFACTURER IS NOT CERTAIN THAT HIS PRODUCT MEETS THESE REQUIREMENTS OR NOT, THEN THE MANUFACTURER SHALL SUBMIT DATA AS REQUIRED TO OBTAIN THE DESIGN

E. THE APPROVAL OF A MANUFACTURER APPLIES TO THE MANUFACTURER ONLY AND DOES NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY OF MEETING ALL APPLICABLE REQUIREMENTS OF THE PLANS AND

F. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS TO OTHER TRADES AND ALL REVISIONS REQUIRED IN ACCOMMODATING ANY PRODUCTS WHICH ARE DIFFERENT FROM THOSE SPECIFIED OR SHOWN.

G. IN REVIEWING A MANUFACTURER FOR ACCEPTANCE, FACTORS CONSIDERED INCLUDE THE FOLLOWING: ENGINEERING DATA SHOWING ITEM'S PERFORMANCE, PROPER LOCAL REPRESENTATION OF MANUFACTURER, LIKELIHOOD OF FUTURE MANUFACTURER'S LOCAL SUPPORT OF PRODUCT, SERVICE AVAILABILITY, PREVIOUS INSTALLATION, PREVIOUS USE BY OWNER/ENGINEER/ARCHITECT, AND RECORD, PRODUCT QUALITY, AVAILABILITY/QUALITY OF MAINTENANCE AND OPERATION DATA, CAPACITY/PERFORMANCE COMPARED TO SPECIFIED ITEMS, ACOUSTICS, ITEMS, GEOMETRY/ACCESS UTILITY NEEDS, AND SIMILAR CONCERNS.

H. IF APPROVAL IS RECEIVED TO USE OTHER THAN SPECIFIED ITEMS, RESPONSIBILITY FOR SPECIFIED CAPACITIES AND ENSURING THAT ITEMS TO BE FURNISHED WILL FIT SPACE AVAILABLE LIES WITH THIS DIVISION

I. IF NON-SPECIFIED EQUIPMENT IS USED AND IT WILL NOT FIT JOB SITE CONDITIONS, THIS DIVISION ASSUMES RESPONSIBILITY FOR REPLACEMENT WITH ITEMS NAMED IN SPECIFICATION.

A. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING FLUSH MOUNTED ACCESS DOORS IN WALLS, CEILINGS, FLOORS, AND CHASES WHERE THE FOLLOWING EQUIPMENT IS CONCEALED AND IS NOT

VALVES (SHUT OFF, BALANCING, CONTROL, TRAP PRIMERS, ETC.).

DAMPERS (CONTROL, BALANCING, FIRE, SMOKE, ETC.).

B. DOORS SHALL BE UL LISTED 20 GA. COLD ROLLED STEEL WITH CONCEALED HINGE, SCREWDRIVER OPERATED LOCK AND PRIME COATED. FURNISH SUITABLE FOR AREA MOUNTED. PROVIDE STAINLESS STEEL ACCESS DOORS FOR

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FEDFRAL WAY PUBLIC SCHOOLS	DECATUR HIGH SCHOOL	WELDING AREA	2800 S.W. 320TH STREET FEDFRAL WAY, WA 98023
REVISI	ONS ESCRIPTION		DATE -
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DRA	WN BY:	FM
CHEC	CKED BY:	FM
PRO	IECT MANAGER:	СТ

DRAWING No. of TOTAL

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PART 3 - EXECUTION

- 3.01 WORKMANSHIP
- 3.02 FINAL INSPECTION
- A. FINAL INSPECTION:
 - REPRESENTATIVES.

3.03 CLOSEOUT SUBMITTALS

- 1. COMPLETION OF ALL PUNCHLIST ITEMS
- 2. PERMIT SUBMITTAL
- 4. ASBESTOS FREE STATEMENT
- 5. GUARANTEES

3.04 PREPARATION

- A. EXISTING BUILDINGS

 - FACILITY'S DAILY OPERATION.
 - THIS WILL BE AT NO COST TO THE OWNER.

3.05 INSTALLATION

- OPENINGS IN THE BUILDING CONSTRUCTION.
- B NECESSARY BRACKETS AND HANGERS AS NEEDED.
- D.
- PARAGRAPH.
- 48-INCH CENTERS.

3.06 ADJUSTMENT AND CLEANING

- EVERYTHING IN WORKING ORDER.

3.07 PAINTING

- 3.08 REQUESTS FOR INFORMATION (RFI)

THIS CONTRACTOR SHALL PROVIDE COMPLETED SYSTEMS WITH A NEAT AND FINISHED APPEARANCE. IF, IN THE JUDGMENT OF THE ENGINEER, ANY PORTION OF THE WORK HAS NOT BEEN PERFORMED IN A WORKMANLIKE MANNER OR IS LEFT IN A ROUGH, UNFINISHED STATE, THIS CONTRACTOR WILL BE REQUIRED TO REMOVE, REINSTALL, OR REPLACE SAME AND PATCH AND PAINT SURROUNDING SURFACES IN A MANNER ACCEPTABLE TO THE ENGINEER, WITHOUT INCREASE IN COST TO THE OWNER.

1. PRIOR TO ACCEPTANCE OF THE MECHANICAL WORK, THE CONTRACTOR SHALL PUT ALL MECHANICAL SYSTEMS INTO OPERATION FOR A PERIOD OF NOT LESS THAN 5 WORKING DAYS SO THAT THEY MAY BE INSPECTED BY THE ARCHITECT/ENGINEER AND THE OWNER'S

2. THE TIME OF THE FINAL INSPECTION SHALL BE MUTUALLY AGREED TO BY THE OWNER, ENGINEER, AND CONTRACTOR.

A. REQUIREMENTS: FINAL APPROVAL OF MECHANICAL INSTALLATION WILL BE RECOMMENDED UPON COMPLETION OF THE FOLLOWING:

3. REPRODUCIBLE AS-BUILT DRAWINGS DELIVERED TO ARCHITECT

1. CUT CAREFULLY TO MINIMIZE NECESSITY FOR REPAIRS TO EXISTING WORK. DO NOT CUT BEAMS, COLUMNS, OR TRUSSES. 2. PATCH AND REPAIR WALLS, FLOORS, CEILINGS, AND ROOFS WITH MATERIALS OF SAME QUALITY AND APPEARANCE AS ADJACENT SURFACES UNLESS OTHERWISE SHOWN. SURFACE FINISHES BY GENERAL CONTRACTOR.

3. CUTTING, PATCHING, REPAIRING, AND REPLACING PAVEMENTS, SIDEWALKS, ROADS, AND CURBS TO PERMIT INSTALLATION OF WORK OF THIS DIVISION IS RESPONSIBILITY OF SECTION INSTALLING WORK.

4. THIS WORK SHALL BE SCHEDULED SUCH THAT UTILITY SERVICES AND/OR EXISTING SYSTEMS FOR THE FACILITY ARE NOT INTERRUPTED DURING NORMAL OPERATING HOURS, WITHOUT PRIOR WRITTEN PERMISSION OF THE OWNER'S REPRESENTATIVE. WORK THAT IS PERFORMED DURING NORMAL OPERATIONAL HOURS SHALL NOT INTERFERE WITH THE NORMAL FUNCTION OF THE

5. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL EXISTING MECHANICAL EQUIPMENT AND UTILITIES INDICATED TO BE REMOVED ON THE DRAWINGS. THE MECHANICAL CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE REMOVAL AND REINSTALLATION OF ALL EXISTING MECHANICAL EQUIPMENT AND UTILITIES THAT WILL INTERFERE WITH INSTALLATION AND OPERATION OF ANY NEW CONSTRUCTION INDICATED OR REQUIRED AND SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL EXISTING MECHANICAL EQUIPMENT AND UTILITIES INDICATED TO BE ABANDONED THAT WILL INTERFERE WITH INSTALLATION AND OPERATION OF ANY NEW CONSTRUCTION INDICATED OR REQUIRED. ALL MECHANICAL EQUIPMENT (OTHER THAN PIPING) TO BE REMOVED SHALL REMAIN THE PROPERTY OF THE OWNER, AND SHALL BE TRANSPORTED, STORED, OR DISPOSED OF, AS DIRECTED BY THE OWNER.

A. VALVES AND OTHER DEVICES WHICH ARE MANUALLY ADJUSTED OR OPERATED SHALL BE LOCATED SO AS TO BE EASILY ACCESSIBLE BY A PERSON STANDING ON THE FLOOR. ANY SUCH ITEMS WHICH ARE NOT IN THE OPEN SHALL BE MADE ACCESSIBLE THROUGH ACCESS

GAUGES, THERMOMETERS, INSTRUMENTATION, AND OTHER COMPONENTS WHICH ARE INSTALLED TO MONITOR EQUIPMENT PERFORMANCE, OPERATING CONDITIONS, ETC., SHALL BE ORIENTED SO AS TO BE EASILY READ BY A PERSON STANDING ON THE FLOOR. PROVIDE

C. IF CIRCUMSTANCES AT A PARTICULAR LOCATION MAKE THE ACCESSIBLE INSTALLATION OF AN ITEM DIFFICULT OR INCONVENIENT, THE SITUATION SHALL BE DISCUSSED WITH THE ARCHITECT/ENGINEER BEFORE INSTALLING THE ITEM IN A POOR ACCESS LOCATION. DISSIMILAR METALS: PROVIDE SEPARATIONS BETWEEN ALL DISSIMILAR METALS. WHERE NOT SPECIFIED IN ANOTHER WAY, USE 10 MIL

BLACK PLASTIC TAPE WRAPPED AT POINT OF CONTACT OR PLASTIC CENTERING INSERTS. E. PROVIDE OFFSETS AROUND ALL ELECTRICAL PANELS (AND SIMILAR ELECTRICAL EQUIPMENT) TO MAINTAIN SPACE CLEAR ABOVE AND

BELOW PANEL TO STRUCTURE AND CLEARANCE OF 3.5 FEET DIRECTLY IN FRONT OF PANEL, EXCEPT WHERE INDICATED OTHERWISE OR REQUIRED BY NEC TO BE MORE. SUCH OFFSETS ARE TYPICALLY NOT SHOWN ON THE DRAWINGS. BUT ARE REQUIRED PER THIS

PIPING THROUGH FRAMING: PIPING THROUGH FRAMING SHALL BE INSTALLED IN THE APPROXIMATE CENTER OF THE MEMBER. WHERE LOCATED SUCH THAT NAILS OR SCREWS ARE LIKELY TO DAMAGE THE PIPE, A STEEL PLATE AT LEAST 1/16-INCH THICK SHALL BE INSTALLED TO PROVIDE PROTECTION. AT METAL FRAMING, WRAP PIPING TO PREVENT CONTACT OF DISSIMILAR METALS. AT METAL AND WOOD FRAMING. PROVIDE PLASTIC PIPE INSULATORS AT PIPING PENETRATIONS THROUGH FRAMING NEAREST EACH FIXTURE AND ON AT LEAST

G. SAFETY PROTECTION: ALL PIPING, AND RELATED ITEMS INSTALLED BY THIS CONTRACTOR THAT PRESENT A SAFETY HAZARD (I.E., ITEMS INSTALLED AT/NEAR HEAD HEIGHT, ITEMS PROJECTING INTO MAINTENANCE ACCESS PATHS, ETC.) SHALL BE COVERED (AT HAZARDOUS AREA) WITH 3/4" THICK ELASTOMERIC INSULATION AND 2" WIDE REFLECTIVE RED/WHITE STRIPED SELF-STICKING SAFETY TAPE.

EQUIPMENT ACCESS: ACCESS TO EQUIPMENT IS OF UTMOST IMPORTANCE. CONTRACTOR SHALL APPLY EXTRA ATTENTION TO THE LAYING OUT OF PIPE AND DUCT ROUTINGS, AND IN COORDINATING ALL WORK. POOR ACCESS TO EQUIPMENT WILL NOT BE ACCEPTED. CONTRACTOR SHALL NOTE THAT IN ESSENTIALLY ALL AREAS, PIPING ROUTED IN CEILING SPACE NEEDS TO RUN IN JOIST SPACE, NECESSITATING ELBOWS/FITTINGS/TRANSITIONS AT CROSSES WITH OTHER TRADES, AT STRUCTURAL BEAMS, AND AT ALL CONNECTIONS TO MAINS AND BRANCHES. HATCHED AREAS AT HVAC UNITS INDICATE EQUIPMENT ACCESS AREAS. THESE (AND ALL OTHER) ACCESS AREAS SHALL BE CLEAR OF OBSTRUCTIONS. THE MECHANICAL CONTRACTOR IS RESPONSIBLE TO COORDINATE AND ENSURE THAT ALL TRADES STAY CLEAR OF ACCESS AREAS FOR ANY DIVISION 22 AND 23 FURNISHED EQUIPMENT.

PIPE INSTALLATION: INSTALL PIPING IN LONGEST REASONABLE LENGTHS. THE USE OF SHORT LENGTHS OF PIPE WITH MULTIPLE COUPLINGS WHERE A SINGLE LENGTH OF PIPE COULD HAVE BEEN USED IS NOT ACCEPTABLE.

A. CLEAN EXPOSED PIPING, DUCTWORK, EQUIPMENT, AND FIXTURES, REMOVE DEBRIS FROM SITE. REPAIR ALL DAMAGED FINISHES AND LEAVE

B. REMOVE STICKERS FROM FIXTURES AND ADJUST FLUSH VALVES.

A. PAINT ALL EXPOSED PIECES OF EQUIPMENT IF NOT FACTORY FINISHED OR PAINTED UNDER THE ARCHITECTURAL SECTION OF THESE SPECIFICATIONS. PAINT SHALL BE ONE COAT PRIMER AND TWO COATS ENAMEL COLOR AS DIRECTED BY THE ARCHITECT.

A. IT IS OUR INTENT TO PROVIDE A TIMELY RESPONSE FOR RFIS REGARDING DIVISION 22 AND 23 WORK. TO FURTHER EXPEDITE THIS PROCESS, IF A SUGGESTION CAN BE DETERMINED OR DERIVED AT BY THE INITIATOR OF THE RFI, IT IS REQUIRED THIS SUGGESTION BE SUPPLIED WITH THE SUBMITTED RFI. IF NO SUGGESTION IS GIVEN WHERE ONE IS POSSIBLE, THE RFI WILL BE RETURNED AS INCOMPLETE. RFI'S WILL BE RETURNED TO THE CONTRACTOR WITHIN SEVEN (7) BUSINESS DAYS FROM THE TIME RECEIVED BY THE ARCHITECT/ENGINEER REPRESENTATIVE. ALL MECHANICAL RFIS SHALL BE WRITTEN ON THE FORM PROVIDED AT THE BACK OF THIS SECTION.

END OF SECTION 20 00 00





REUSE OF DOCUMENTS THE DRAWINGS AND SPECIFICATIONS CONTAINED HEREIN ARE THE PROPRIETARY, UNPUBLISHED PROPERTY OF BCE ENGINEERS AND SHALL NOT BE REPRODUCED, COPIED, OR DISCLOSED IN WHOLE OR PART WITHOUT THE WRITTEN PERMISSION OF BCE ENGINEERS.

FEDERAL WAY PUBLIC SCHOOLS DECATUR HIGH SCHOOL WELDING AREA	2800 S.W. 320TH STREET FEDERAL WAY, WA 98023			
SPECIFICATIONS II				
REVISIONS NO. DESCRIPTION 	DATE -			
DRAWN BY:	FM			
	FM			
PROJECT MANAGER: CT				
DRAWING No. of TOTAL				

SECTION 22 10 05 PLUMBING PIPING

PART 1 - GENERAL

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 - 1. SANITARY SEWER.
 - 2. DOMESTIC WATER.
- 3. FLANGES, UNIONS, AND COUPLINGS.
- 4. PIPE HANGERS AND SUPPORTS.
- 5. RELIEF VALVES.
- 1.02 RELATED REQUIREMENTS
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- B. SECTION 22 05 53 IDENTIFICATION FOR PLUMBING PIPING
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		AQ.	NSF 61 - DRINKING WATER SYSTEM COMPONENTS - HEALTH EFFECTS; 2017.		
R PLUMBING PIPING AND EQUIPMENT.		AR.	NSF 372 - DRINKING WATER SYSTEM COMPONENTS - LEAD CONTENT; 2016.		
AND EQUIPMENT.		AS.	PPI TR-4 - PPI LISTING OF HYDROSTATIC DESIGN BASIS (HDB), HYDROSTATIC DESIGN STRESS (HDS), STRENGTH DESIGN BASIS (SDB), PRESSURE DESIGN BASIS (PDB), AND MINIMUM REQUIRED STRENGTH (MRS) RATINGS FOR THERMOPLASTIC PIPING MATERIALS OR PIPE; 2017.	E	В.
VALVES AND AUTOMATIC GAS SHUTOFF	1.04	SUB	MITTALS		
URE FITTINGS; 2012.		Α.	PRODUCT DATA: PROVIDE DATA ON PIPE MATERIALS, PIPE FITTINGS, VALVES, AND ACCESSORIES. PROVIDE MANUFACTURERS CATALOG INFORMATION. INDICATE VALVE DATA AND RATINGS.		
LDER-JOINT PRESSURE FITTINGS; 2013.		В.	WELDER CERTIFICATE: INCLUDE WELDERS CERTIFICATION OF COMPLIANCE WITH ASME BPVC-IX.		
AGE FITTINGS - DWV; 2016.		C.	SHOP DRAWINGS: FOR NON-PENETRATING ROOFTOP SUPPORTS, SUBMIT DETAILED LAYOUT DEVELOPED FOR THIS PROJECT, WITH DESIGN CALCULATIONS FOR LOADINGS AND SPACINGS.		
		D.	OPERATION AND MAINTENANCE DATA:		
			1. DOMESTIC WATER STERILIZATION TEST.		
ERT FITTINGS FOR POLYETHYLENE (PE)			2. DOMESTIC WATER PRESSURE TESTS.		
NING OF POLYOLEFIN PIPE AND FITTINGS: 2007	1.05	QUA			
		A. D	PERFORM WORK IN ACCORDANCE WITH APPLICABLE CODES.		
CHLORIDE) (PVC) PLASTIC DRAIN, WASTE, AND		Б. С.	<u>VALVES</u> . MANUFACTORER'S NAME AND PRESSURE RATING MARKED ON VALVE BODT. IDENTIFY PIPE WITH MARKING INCLUDING SIZE, ASTM MATERIAL CLASSIFICATION, ASTM SPECIFICATION, POTABLE WATER CERTIFICATION, WATER PRESSURE RATING.	01 I	INS
STRUCTURAL STEEL; 2014.		D.	DOMESTIC WATER FITTINGS, JOINING MATERIALS, AND ALL OTHER APPURTENANCES IN CONTACT WITH POTABLE WATER SHALL BE LEAD-FREE EXCEPT THOSE SPECIFICALLY EXEMPTED IN SECTION 3874 OF THE	Ë	А. В.
MALLEABLE IRON CASTINGS; 1999			SAFE WATER DRINKING ACT.	(C.
HOT-DIP GALVANIZED) COATINGS ON IRON AND			 a. NOT CONTAINING MORE THAN 0.2% LEAD WHEN USED WITH RESPECT TO SOLDER AND FLUX; 	E	Ј. Е.
ESS AND WELDED AUSTENITIC STAINLESS			AND b. NOT MORE THAN A WEIGHTED AVERAGE OF 0.25% WHEN USED WITH RESPECT TO THE VETTED	F	F.
			SURFACES OF PIPES, PIPE FITTINGS, PLUMBING FITTINGS, AND FIXTURES.	ŀ	Э. Н.
L; 2008 (REAPPROVED 2014).	1.06	DELI	VERY, STORAGE, AND HANDLING		 I.
PPER PIPE, STANDARD SIZES; 2015A.		А.	PROVIDE TEMPORARY END CAPS AND CLOSURES ON PIPING AND FITTINGS. MAINTAIN IN PLACE UNTIL	·	J.
OPPER WATER TOBE, 2010. OPPER WATER TUBE (METRIC); 2016.		B.	PROTECT PIPING SYSTEMS FROM ENTRY OF FOREIGN MATERIALS BY TEMPORARY COVERS, COMPLETING SECTIONS OF THE WORK, AND ISOLATING PARTS OF COMPLETED SYSTEM.	ł	K.
ASTE ELUXES FOR SOLDERING OF COPPER AND	ר			L	∟.
		T 2 - F		ľ	М.
Y JOINTS BY SOLDERING OF COPPER AND	2.01	PIF	YE AND PIPE FITTINGS		NI
		0.	<u>STEEL FIPE</u> . ASTM ASS/ASSM, SCHEDULE 40 BLACK	ſ	N. 0
KETS FOR CAST IRON SOIL PIPE AND FITTINGS,			2. JOINTS: THREADED OR WELDED TO ASME B31.1 3.0	02 F	U. FIE
ENE (PE) PLASTIC PIPE (SIDR-PR) BASED ON		B.	<u>COPPER TUBE</u> : ASTM B88 (ASTM B88M), TYPE K (A), DRAWN	I	A.
EMENTS FOR POLY(VINYL CHLORIDE) (PVC)			 <u>FITTINGS</u>: ASME B16.18, CAST COPPER ALLOY OR ASME B16.22, WROUGHT COPPER AND BRONZE JOINTS: ASTM B32, SOLDER, GRADE SN95 	E	B.
RIMER & SOLVENT CEMENT) METHOD OF				(C.
POLY (VINYL CHLORIDE) (CPVC) PIPE AND PIPINO	G <mark>2.02</mark>	AIR (DUTLETS QUICK CONNECTOR: 3/8-INCH BRASS. SNAP ON CONNECTOR WITH SELF-CLOSING VALVE. STYLE A		
OLY(VINYL CHLORIDE) (PVC) SEWER PIPE AND	2.03	UNIO	INS AND COUPLINGS		
LENE INJECTION AND EXTRUSION MATERIALS;		Λ.	1. <u>FERROUS PIPE</u> : 150 PSI MALLEABLE IRON THREADED UNIONS		
) POLYETHYLENE (PEX) TUBING; 2017.		-	2. <u>COPPER TUBE AND PIPE</u> : 150 PSI BRONZE UNIONS WITH SOLDERED JOINTS		
POLYETHYLENE (PEX) PLASTIC HOT- AND		В.	DIELECTRIC CONNECTIONS: UNION WITH GALVANIZED OR PLATED STEEL THREADED END, COPPER SOLDER END, WATER IMPERVIOUS ISOLATION BARRIER.		
ISION FITTINGS WITH PEX REINFORCING RINGS		C.	FLEXIBLE CONNECTOR: NEOPRENE WITH BRASS THREADED CONNECTORS		
BRAZING AND BRAZE WELDING: 2011	0.00	יים			
	2.02	۲IF ۸			
ES AND HYDRANTS; 2017.		А.	1. IF TYPE OF HANGER OR SUPPORT FOR A PARTICULAR SITUATION IS NOT INDICATED, SELECT		
			APPROPRIATE TYPE USING MSS SP-58 RECOMMENDATIONS.		
			Z. <u>HANGER RUDS</u> : THREADED HUT RULLED STEEL, ELECTRO-GALVANIZED OR CADMIUM PLATED.		

HANGER RODS SHALL BE SIZED SO THAT THE TOTAL LOAD (INCLUDING PIPE OR DUCT, INSULATION, HANGERS, AND FLUID) DOES NOT EXCEED THE FOLLOWING:

- a. 610 POUNDS FOR 3/8" DIAMETER RODS.
- b. 1130 POUNDS FOR 1/2" DIAMETER RODS.
- <u>OVERHEAD SUPPORTS</u>: INDIVIDUAL STEEL ROD HANGERS ATTACHED TO STRUCTURE OR TO TRAPEZE HANGERS.
- a. COLD AND HOT PIPE SIZES 6 INCH AND LARGER: DOUBLE HANGERS.
- TRAPEZE HANGERS: WELDED STEEL CHANNEL FRAMES ATTACHED TO STRUCTURE.
- 5. <u>VERTICAL PIPE SUPPORT</u>: STEEL RISER CLAMP, EPOXY COATED.
- 6. <u>STEEL</u>: PROVIDE STRUCTURAL STEEL PER ASTM A36/A36M.
- 7. <u>WOOD</u>: SHALL BE FIRE TREATED.

HANGER FASTENERS: ATTACH HANGERS TO STRUCTURE USING APPROPRIATE FASTENERS, AS FOLLOWS:

- 1. <u>CONCRETE WEDGE EXPANSION ANCHORS</u>: COMPLYING WITH ICC-ES AC193.
- 2. <u>MASONRY WEDGE EXPANSION ANCHORS</u>: COMPLYING WITH ICC-ES AC01.
- 3. <u>CONCRETE SCREW TYPE ANCHORS</u>: COMPLYING WITH ICC-ES AC193.
- 4. <u>MASONRY SCREW TYPE ANCHORS</u>: COMPLYING WITH ICC-ES AC106.
- 5. <u>CONCRETE ADHESIVE TYPE ANCHORS</u>: COMPLYING WITH ICC-ES AC308.
- 6. <u>OTHER TYPES</u>: AS REQUIRED.

7. MANUFACTURERS:

- a. POWERS FASTENERS, INC
- b. RAWPLUG
- c. PHILLIPS
- d. HILTI
- e. CADDY

STALLATION

PIPE RUNNING UNDERGROUND SHALL BE TYPE 'K' COPPER.

PIPE RUNNING CONCEALED ABOVE FINISH FLOOR SHALL BE TYPE 'K' COPPER OR STEEL.

- INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- INSTALL COMPRESSOR UNIT ON CONCRETE HOUSEKEEPING PAD. SEE SECTION 03 30 00.

INSTALL COMPRESSOR UNIT ON VIBRATION ISOLATORS. LEVEL AND BOLT IN PLACE. SEE SECTION 22 05 48. MAKE AIR COCK AND DRAIN CONNECTION ON HORIZONTAL CASING.

INSTALL LINE SIZE GATE VALVE AND CHECK VALVE ON COMPRESSOR DISCHARGE. SEE SECTION 22 05 23. INSTALL REPLACEABLE CARTRIDGE TYPE FILTER SILENCER OF ADEQUATE CAPACITY FOR EACH COMPRESSOR.

CONNECT CONDENSATE DRAINS TO NEAREST FLOOR DRAIN OR WHERE INDICATED ON PLANS. INSTALL VALVED BYPASS AROUND AIR DRYER. FACTORY INSULATE INLET AND OUTLET CONNECTIONS. SEE SECTION 22 05 23.

INSTALL VALVED DRIP CONNECTIONS AT LOW POINTS OF PIPING SYSTEM. SEE SECTION 22 05 23.

INSTALL TAKEOFFS TO OUTLETS FROM TOP OF MAIN, WITH SHUT OFF VALVE AFTER TAKEOFF. SLOPE TAKEOFF PIPING TO OUTLETS.

INSTALL COMPRESSED AIR COUPLINGS, FEMALE QUICK CONNECTORS, AND PRESSURE GAUGES WHERE OUTLETS ARE INDICATED.

IDENTIFY PIPING SYSTEM AND COMPONENTS. SEE SECTION 22 05 53.

PROVIDE A SHUT-OFF VALVE AT THE CONNECTION OF EACH PIECE OF EQUIPMENT.

ELD QUALITY CONTROL

<u>COMPRESSED AIR PIPING LEAK TEST</u>: PRIOR TO INITIAL OPERATION, CLEAN AND TEST COMPRESSED AIR PIPING IN ACCORDANCE WITH ASME B31.1.

REPAIR OR REPLACE COMPRESSED AIR PIPING AS REQUIRED TO ELIMINATE LEAKS, AND RETEST TO DEMONSTRATE COMPLIANCE.

CAP AND SEAL ENDS OF PIPING WHEN NOT CONNECTED TO MECHANICAL EQUIPMENT.





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FEDERAL WAY PUBLIC SCHOOLS	DECATUR HIGH SCHOOL	WELDING AREA	2800 S.W. 320TH STREET FEDERAL WAY, WA 98023

REVISIONS					
NO.	DESCRIPTION	DATE			
-	-	-			
DRAWN BY: FM					
CHECKED BY: FM					
PROJECT MANAGER: CT					

DRAWING No. of TOTAL

M004

SECTION 22 10 05 PLUMBING PIPING

PART 1 - GENERAL

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		AQ.	NSF 61 - DRINKING WATER SYSTEM COMPONENTS - HEALTH EFFECTS; 2017.		
R PLUMBING PIPING AND FOUIPMENT		AR.	NSF 372 - DRINKING WATER SYSTEM COMPONENTS - LEAD CONTENT; 2016.		
AND EQUIPMENT.		AS.	PPI TR-4 - PPI LISTING OF HYDROSTATIC DESIGN BASIS (HDB), HYDROSTATIC DESIGN STRESS (HDS), STRENGTH DESIGN BASIS (SDB), PRESSURE DESIGN BASIS (PDB), AND MINIMUM REQUIRED STRENGTH (MRS) RATINGS FOR THERMOPLASTIC PIPING MATERIALS OR PIPE; 2017.		B.
VALVES AND AUTOMATIC GAS SHUTOFF	1.04	SUB	MITTALS		
URE FITTINGS; 2012.		A.	PRODUCT DATA: PROVIDE DATA ON PIPE MATERIALS, PIPE FITTINGS, VALVES, AND ACCESSORIES. PROVIDE MANUFACTURERS CATALOG INFORMATION. INDICATE VALVE DATA AND RATINGS.		
LDER-JOINT PRESSURE FITTINGS; 2013.		В.	WELDER CERTIFICATE: INCLUDE WELDERS CERTIFICATION OF COMPLIANCE WITH ASME BPVC-IX.		
AGE FITTINGS - DWV; 2016.		C.	SHOP DRAWINGS: FOR NON-PENETRATING ROOFTOP SUPPORTS, SUBMIT DETAILED LAYOUT DEVELOPED FOR THIS PROJECT, WITH DESIGN CALCULATIONS FOR LOADINGS AND SPACINGS.		
		D.	OPERATION AND MAINTENANCE DATA:		
			1. DOMESTIC WATER STERILIZATION TEST.		
ERT FITTINGS FOR POLYETHYLENE (PE)			2. DOMESTIC WATER PRESSURE TESTS.		
	1.05	QUA	LITY ASSURANCE		
NING OF POLYOLEFIN PIPE AND FITTINGS; 2007		А.	PERFORM WORK IN ACCORDANCE WITH APPLICABLE CODES.		
CHLORIDE) (PVC) PLASTIC DRAIN, WASTE, AND		В.	VALVES: MANUFACTURER'S NAME AND PRESSURE RATING MARKED ON VALVE BODY.		
		С.	IDENTIFY PIPE WITH MARKING INCLUDING SIZE, ASTM MATERIAL CLASSIFICATION, ASTM SPECIFICATION, POTABLE WATER CERTIFICATION, WATER PRESSURE RATING.	.01	ins A.
STRUCTURAL STEEL; 2014.		D.	DOMESTIC WATER FITTINGS, JOINING MATERIALS, AND ALL OTHER APPURTENANCES IN CONTACT WITH POTABLE WATER SHALL BE LEAD-FREE EXCEPT THOSE SPECIFICALLY EXEMPTED IN SECTION 3874 OF THE SAFE WATER DRINKING ACT		B.
CMALLEABLE IRON CASTINGS; 1999					С. П
IOT-DIP GALVANIZED) COATINGS ON IRON AND			a NOT CONTAINING MORE THAN 0.2% I FAD WHEN USED WITH RESPECT TO SOLDER AND FLUX.		D. F
·			AND		F.
ESS AND WELDED AUSTENITIC STAINLESS			b. NOT MORE THAN A WEIGHTED AVERAGE OF 0.25% WHEN USED WITH RESPECT TO THE VETTED SURFACES OF PIPES, PIPE FITTINGS, PLUMBING FITTINGS, AND FIXTURES.		G. H
L; 2008 (REAPPROVED 2014).	1.06	DELI	VERY, STORAGE, AND HANDLING		I.
PPER PIPE, STANDARD SIZES; 2015A.		А.	PROVIDE TEMPORARY END CAPS AND CLOSURES ON PIPING AND FITTINGS. MAINTAIN IN PLACE UNTIL		J.
PPER WATER TUBE; 2016.		R			
OPPER WATER TUBE (METRIC); 2016. INAGE TUBE (DWV); 2013.		D.	SECTIONS OF THE WORK, AND ISOLATING PARTS OF COMPLETED SYSTEM.		K. L.
ASTE FLUXES FOR SOLDERING OF COPPER AND	D PAR	T 2 - F	RODUCTS		N /
	2.01	PIF	PE AND PIPE FITTINGS		IVI.
		C.	STEEL PIPE: ASTM A53/A53M, SCHEDULE 40 BLACK		N.
KETS FOR CAST IRON SOIL PIPE AND FITTINGS;			1. <u>FITTINGS</u> : ASME B16.3, MALLEABLE IRON, OR ASTM A234/A234M, WROUGHT STEEL WELDING TYPE		0.
			2. <u>JOINTS</u> : THREADED OR WELDED TO ASME B31.1 3.	.02	FIE
ENE (PE) PLASTIC PIPE (SIDR-PR) BASED ON		В.	<u>COPPER TUBE</u> : ASTM B88 (ASTM B88M), TYPE K (A), DRAWN		Α.
EMENTS FOR POLY(VINYL CHLORIDE) (PVC)			 <u>FITTINGS</u>: ASME B16.18, CAST COPPER ALLOY OR ASME B16.22, WROUGHT COPPER AND BRONZE <u>JOINTS</u>: ASTM B32, SOLDER, GRADE SN95 		B.
RIMER & SOLVENT CEMENT) METHOD OF	2 02				C.
POLY (VINYL CHLORIDE) (CPVC) PIPE AND PIPING	G z.0z		OUTETS		
OLY(VINYL CHLORIDE) (PVC) SEWER PIPE AND	2.03	UNIC	NS AND COUPLINGS		
LENE INJECTION AND EXTRUSION MATERIALS;		A.	UNIONS: 1. <u>FERROUS PIPE</u> : 150 PSI MALLEABLE IRON THREADED UNIONS		
) POLYETHYLENE (PEX) TUBING: 2017.			2. <u>COPPER TUBE AND PIPE</u> : 150 PSI BRONZE UNIONS WITH SOLDERED JOINTS		
POLYETHYLENE (PEX) PLASTIC HOT- AND		В.	DIELECTRIC CONNECTIONS: UNION WITH GALVANIZED OR PLATED STEEL THREADED END, COPPER SOLDER END, WATER IMPERVIOUS ISOLATION BARRIER.		
ISION FITTINGS WITH PEX REINFORCING RINGS		C.	FLEXIBLE CONNECTOR: NEOPRENE WITH BRASS THREADED CONNECTORS		
BRAZING AND BRAZE WELDING; 2011	2.02	PIF	PE HANGERS AND SUPPORTS		
ES AND HYDRANTS; 2017.		Α.	PROVIDE HANGERS AND SUPPORTS THAT COMPLY WITH MSS SP-58.		
			 IF TYPE OF HANGER OR SUPPORT FOR A PARTICULAR SITUATION IS NOT INDICATED, SELECT APPROPRIATE TYPE USING MSS SP-58 RECOMMENDATIONS. 		
			2. <u>HANGER RODS</u> : THREADED HOT ROLLED STEEL, ELECTRO-GALVANIZED OR CADMIUM PLATED.		

HANGER RODS SHALL BE SIZED SO THAT THE TOTAL LOAD (INCLUDING PIPE OR DUCT, INSULATION, HANGERS, AND FLUID) DOES NOT EXCEED THE FOLLOWING:

- a. 610 POUNDS FOR 3/8" DIAMETER RODS.
- b. 1130 POUNDS FOR 1/2" DIAMETER RODS.
- <u>OVERHEAD SUPPORTS</u>: INDIVIDUAL STEEL ROD HANGERS ATTACHED TO STRUCTURE OR TO TRAPEZE HANGERS.
- a. COLD AND HOT PIPE SIZES 6 INCH AND LARGER: DOUBLE HANGERS.
- TRAPEZE HANGERS: WELDED STEEL CHANNEL FRAMES ATTACHED TO STRUCTURE.
- 5. <u>VERTICAL PIPE SUPPORT</u>: STEEL RISER CLAMP, EPOXY COATED.
- 6. <u>STEEL</u>: PROVIDE STRUCTURAL STEEL PER ASTM A36/A36M.
- 7. <u>WOOD</u>: SHALL BE FIRE TREATED.

HANGER FASTENERS: ATTACH HANGERS TO STRUCTURE USING APPROPRIATE FASTENERS, AS FOLLOWS:

- 1. <u>CONCRETE WEDGE EXPANSION ANCHORS</u>: COMPLYING WITH ICC-ES AC193.
- 2. <u>MASONRY WEDGE EXPANSION ANCHORS</u>: COMPLYING WITH ICC-ES AC01.
- 3. <u>CONCRETE SCREW TYPE ANCHORS</u>: COMPLYING WITH ICC-ES AC193.
- 4. <u>MASONRY SCREW TYPE ANCHORS</u>: COMPLYING WITH ICC-ES AC106.
- 5. <u>CONCRETE ADHESIVE TYPE ANCHORS</u>: COMPLYING WITH ICC-ES AC308.
- 6. <u>OTHER TYPES</u>: AS REQUIRED.
- 7. MANUFACTURERS:
- a. POWERS FASTENERS, INC
- b. RAWPLUG
- c. PHILLIPS
- d. HILTI
- e. CADDY

STALLATION

- PIPE RUNNING UNDERGROUND SHALL BE TYPE 'K' COPPER.
- PIPE RUNNING CONCEALED ABOVE FINISH FLOOR SHALL BE TYPE 'K' COPPER OR STEEL.
- INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- INSTALL COMPRESSOR UNIT ON CONCRETE HOUSEKEEPING PAD. SEE SECTION 03 30 00.
- INSTALL COMPRESSOR UNIT ON VIBRATION ISOLATORS. LEVEL AND BOLT IN PLACE. SEE SECTION 22 05 48. MAKE AIR COCK AND DRAIN CONNECTION ON HORIZONTAL CASING.
- INSTALL LINE SIZE GATE VALVE AND CHECK VALVE ON COMPRESSOR DISCHARGE. SEE SECTION 22 05 23. INSTALL REPLACEABLE CARTRIDGE TYPE FILTER SILENCER OF ADEQUATE CAPACITY FOR EACH COMPRESSOR.
- CONNECT CONDENSATE DRAINS TO NEAREST FLOOR DRAIN OR WHERE INDICATED ON PLANS.
- INSTALL VALVED BYPASS AROUND AIR DRYER. FACTORY INSULATE INLET AND OUTLET CONNECTIONS. SEE SECTION 22 05 23.
- INSTALL VALVED DRIP CONNECTIONS AT LOW POINTS OF PIPING SYSTEM. SEE SECTION 22 05 23.
- INSTALL TAKEOFFS TO OUTLETS FROM TOP OF MAIN, WITH SHUT OFF VALVE AFTER TAKEOFF. SLOPE TAKEOFF PIPING TO OUTLETS.
- INSTALL COMPRESSED AIR COUPLINGS, FEMALE QUICK CONNECTORS, AND PRESSURE GAUGES WHERE OUTLETS ARE INDICATED.
- IDENTIFY PIPING SYSTEM AND COMPONENTS. SEE SECTION 22 05 53.
- PROVIDE A SHUT-OFF VALVE AT THE CONNECTION OF EACH PIECE OF EQUIPMENT.

ELD QUALITY CONTROL

<u>COMPRESSED AIR PIPING LEAK TEST</u>: PRIOR TO INITIAL OPERATION, CLEAN AND TEST COMPRESSED AIR PIPING IN ACCORDANCE WITH ASME B31.1.

REPAIR OR REPLACE COMPRESSED AIR PIPING AS REQUIRED TO ELIMINATE LEAKS, AND RETEST TO DEMONSTRATE COMPLIANCE.

CAP AND SEAL ENDS OF PIPING WHEN NOT CONNECTED TO MECHANICAL EQUIPMENT.





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FEDERAL WAY PUBLIC SCHOOLS	DECATUR HIGH SCHOOL	WELDING AREA	2800 S.W. 320TH STREET FEDERAL WAY, WA 98023

	REVISIONS						
	NO.	DESCRIPTION	DATE				
	-	-	-				
	DRAV	VN BY:	FM				
	FM						
	PROJ	ECT MANAGER:	СТ				

DRAWING No. of TOTAL

MOO5 DATE: 01-06-25

SUBMITTAL: CONST. SET PROJECT No. 240-317





- 1. COMPRESSED AIR SHALL BE RAN TIGHT TO WALLS AND UNDER ROOF STRUCTURE.
- 2. COMPRESSED AIR SHALL BE PROVIDED WITH ISOLATION VALVE AND COALESCING FILTER AT CONNECTION TO EXISTING.
- 3. PROVIDE QUICK CONNECT DROPS AT MINIMUM 4' AFF. COORDINATE FINAL HEIGHT WITH OWNER.

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FEDERAL WAY PUBLIC SCHOOLS DECATUR HIGH SCHOOL	WELDING AREA	2800 S.W. 320TH STREET FEDERAL WAY, WA 98023
MECHANICAL PLAN		
REVISIONS NO. DESCRIPTION - - <t< td=""><td>of To</td><td>DATE - FM FM CT OTAL</td></t<>	of To	DATE - FM FM CT OTAL
DATE: 01-06-25 SUBMITTAL: CON PROJECT No. 240-3	ST. SET	

	UNIT NO	MANUFACTURER
	EF-1	GREENHECK
NC	DTES FOR E	XHAUST FAN SCHED
1. 2. 3. 4. 5.	ALL EXHAU FAN SHALI FAN MOTO PROVIDE V MOTOR TO REPLACE	JST FANS TO BE WIRE OPERATE AT A MININ R TO BE ECM. PROVIE VITH PUSH BUTTON FO ACCEPT A 0-10 VDC EXISTING MOTORIZED

FACTORY INSTALLED
HINGED BASE WITH
RESTRAINING CABLES

8" MIN ABOVE
FINISHED ROOF

ROOFING	
RIGID INSULATION ABOVE ROOF DECK	\ \
	``

DECKING

FASTEN CURB TO ROOF DECK WITH MINIMUM 3 LAG SCREWS PER SIDE AND 2 PER CORNER -----

STREAM ACTUATOR -



TYPICAL ROOF MOUNT EXHAUST FAN INSTALLATION DETAIL SCALE: DIAGRAMMATIC

EXHAUST FAN SCHEDULE																	
MODEL			PERFORMANCE			DAMDED				ELECTRICAL				STARTER	DISCONNECT	WEIGHT	
MODEL	LUCATION	CONFIGURATION	CFM	ESP	RPM	DAMPER	SPEED CONTROL	HP	внр	MCA	МОР	VOLTS	PH	FURNISHED BY	FURNISHED BY	(LBS)	KEWARAS
G-100-VG	ROOM 321	DOWNBLAST	700	0.5	1236	EXISTING	ECM TWO SPEED	0.25	0.11	2.6	15	208	1	NOTE 9	NOTE 9		1,2,3,4,5,6
JLE																	

ED FROM MOTOR TO BOX ON EXTERIOR OF FAN ENCLOSURE

MUM CFM OF 350.

DE WITH CURB ADAPTER TO MATCH EXISTING INSULATION VALUE.

FOR ADDITIONAL EXHAUST AIR UP TO 700 CFM.

C INPUT SIGNAL FOR SPEED CONTROL

D DAMPER ACTUATOR AND INTERLOCK TO EF-1.

WALL MOUNTED FUME EXTRACTOR SCHEDULE												
							SOUND	MOUNTING	ELE			
UNIT NO	MANUFACTURER	MODEL	LOCATION	CFM	DIAMETER (IN)	LENGTH (FT)	(DBA)	HEIGHT (FT)	AMPS	VOLTS	PH	REMARKS
FE-1	SENTRY AIR SYSTEMS	200-SS-225	ROOM 321	91	4	4	64	7	0.5	120	1	1,2,3
FE-2	SENTRY AIR SYSTEMS	200-SS-225	ROOM 321	91	4	4	64	7	0.5	120	1	1,2,3
FE-3	SENTRY AIR SYSTEMS	200-SS-225	ROOM 321	91	4	4	64	7	0.5	120	1	1,2,3
FE-4	SENTRY AIR SYSTEMS	200-SS-225	ROOM 321	91	4	4	64	7	0.5	120	1	1,2,3
FE-5	SENTRY AIR SYSTEMS	200-SS-225	ROOM 321	91	4	4	64	7	0.5	120	1	1,2,3
FE-6	SENTRY AIR SYSTEMS	200-SS-225	ROOM 321	91	4	4	64	7	0.5	120	1	1,2,3
NOTES FOR	NOTES FOR WALL MOUNTED FUME EXTRACTOR SCHEDULE											

. PROVIDE WITH REMOTE CONTROL BOX AT ADA HEIGHT.

. COORDINATE WITH OWNER FOR FINAL MOUNTING HEIGHT AND LENGTH OF EXTRACTION HOSE. BASIS BLACK FLEX SENTRY HOSE #SS-004-BH, UL 95V-0. . PROIVDE WITH QUICK CHANGE PRE-FILTER.





- 2. DAMPER END SWITCH STATUS 3. SUPPLY FAN START/STOP, STATU, ALARM, RUNTIME, SIGNAL
- 4. WEEKDAY, WEEKEND AND HOLIDAY SCHEDULES

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RE THE HERI PRO BE WHC PERI	USE OF DRAWINGS EIN ARE T PERTY OF REPRODUC JLE OR H MISSION OF	THER THER TR TR TR TR TR TR TR TR TR T	ANDR TAS TAS 6534 STERED 6634 STERED 6634 STERED 7AL ENG CIFICATIO PRIETARY, INEERS A IED, OR ITHOUT SINEERS.	S NS CONTAINED UNPUBLISHED ND SHALL NOT DISCLOSED IN THE WRITTEN
	FEDERAL WAY PUBLIC SCHOOLS	DECATUR HIGH SCHOOL	WELDING AREA	2800 S.W. 320TH STREET FEDERAL WAY, WA 98023
		MECHANICAL SCHEDULES		
RE NO. - - - - - - - - - - - - - - - - - - -	AWING NC	S IPTION /: NAGER:	of To	DATE FM FM CT DTAL

DATE: 01-06-2	5				
SUBMITTAL:	CONST. SET				
PROJECT No.	240-317				



	ELECTRICAL LEGEND										
SYMBOL											
	LIGHTING										
⊢ →	SURFACE OR PENDANT MOUNT STRIP LIGHT (CIRCLE INDICATES RECESSED OR CONCEALED JUNCTION BOX)										
ť	EMERGENCY BATTERY PACK WITH TWIN HEAD FLOOD PROVIDE ADDITIONAL UNSWITCHED HOT LEG.										
₩ঊ	COMBINATION EXIT/TWIN HEAD FLOOD (PROVIDE DIRECTION ARROWS AS INDICATED) PROVIDE ADDITIONAL UNSWITCHED HOT LEG.										
	RECEPTACLES										
Φ	DUPLEX RECEPTACLE										
$\mathbf{\Phi}^{G}$	DUPLEX RECEPTACLE (G INDICATES GROUND FAULT CIRCUIT INTERRUPTER)										
	EQUIPMENT, WIRING AND RACEWAYS										
\frown	RACEWAY CONCEALED IN WALL OR CEILING										
/~~~	RACEWAY CONCEALED UNDERGROUND OR UNDER FLOOR SLAB, P = PRIMARY , S = SECONDARY										
- 1	GROUNDING SYSTEM PER CODE										
	EXISTING PANELBOARD TO BE RETAINED										
	120/208 VOLT PANELBOARD (OR AT RATED VOLTAGE AS NOTED)										
	277/480 VOLT PANELBOARD										
	MAIN DISTRIBUTION BOARD										
	TRANSFORMER										
$\hat{}$	ENCLOSED CIRCUIT BREAKER, AMPERES AS INDICATED										
- Cr	DISCONNECT SWITCH										
R →	FUSED DISCONNECT SWITCH										
۵	SPECIAL PURPOSE RECEPTACLE										
Q	JUNCTION BOX										
	MISCELLANEOUS										
1	CONSTRUCTION NOTES										
$\langle 1 \rangle$	DEMOLITION NOTES										
w	W INDICATES WEATHERPROOF FOR ALL DEVICES, PROVIDE LOCKING COVER ON RECEPTACLES.										
\$	ALL DEVICES WITH LIGHT LINE WEIGHT INDICATES EXISTING TO BE RETAINED										
\$ [&	ALL DEVICES WITH DASH LINE INDICATES EXISTING TO BE REMOVED										
AHU 1	MECHANICAL EQUIPMENT. SEE MECHANICAL EQUIPMENT SCHEDULE FOR REQUIREMENTS										

MECHANICAL EQUIPMENT CONNECTION SCHEDULE (EXHAUST FANS, AIR HANDLING UNITS, ETC)												
						СШТ		MANUAL	MAGNETIC	FUSED	MOTOR	
						5011		STARTER	STARTER	DISC.	RATED	
EQUIP.	VOLT/PH	VA	MCA	HP	PANEL	BKR	CONDUIT/WIRE SIZE	(NOTE 1)	(NOTE 1)	(NOTE 1)	DISC. SW	REMARKS
EF- 1	240/1	696	2.9	1/4	WP	36,38	1/2" C., (3)#12 & (1) #12 GR		EC	EC-15A		
FE- 1	120/1	90	0.5		WP	35	1/2" C., (2)#12 & (1) #12 GR				BY EC	
FE- 2	120/1	90	0.5		WP	35	1/2" C., (2)#12 & (1) #12 GR				BY EC	
FE- 3	120/1	90	0.5		WP	35	1/2" C., (2)#12 & (1) #12 GR				BY EC	
FE- 4	120/1	90	0.5		WP	35	1/2" C., (2)#12 & (1) #12 GR				BY EC	
FE- 5	120/1	90	0.5		WP	35	1/2" C., (2)#12 & (1) #12 GR				BY EC	
FE- 6	120/1	90	0.5		WP	35	1/2" C., (2)#12 & (1) #12 GR				BY EC	
NOTE: 1.	NOTE: 1. CONTRACTOR LISTED SHALL FURNISH AND INSTALL THE LISTED DEVICE.											



	GENERAL ABBREVIATIONS
С	MOUNT ABOVE COUNTER
EC	ELECTRICAL CONTRACTOR
FLR	FLOOR
MIN	MINIMUM
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
MFR	MANUFACTURER
TYP	TYPICAL
W	WEATHERPROOF

	ELECTRICAL ABBREVIATIONS						
Α	AMPERES						
AIC	AMPERE INTERRUPTING CAPACITY						
ATS	AUTOMATIC TRANSFER SWITCH						
C.	CONDUIT						
CU	COPPER						
EMT	ELECTRICAL METALLIC TUBING						
FLA	FULL LOAD AMPERE(S)						
G	GROUND FAULT CIRCUIT INTERRUPTER						
GFP	GROUND FAULT PROTECTION						
GND	GROUND						
KCMIL	THOUSAND						
KVA	KILOVOLT-AMPERE(S)						
KW	KILOWATT(S)						
MCB	MAIN CIRCUIT BREAKER						
MLO	MAIN LUGS ONLY						
MTS	MANUAL TRANSFER SWITCH						
NEC	NATIONAL ELECTRIC CODE						
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION						
PH	PHASE						
PVC	POLYVINYL CHLORIDE						
RGS	RIGID GALVANIZED STEEL						
SCH	SCHEDULE						
UG	UNDER GROUND						
V	VOLT(S)						
VA	VOLT-AMPERE(S)						
XFMR	TRANSFORMER						
SPD	SURGE PROTECTION DEVICE						

2.	THE ELECT LOCATIONS AND PROVI EQUIPMEN SYSTEM, TO DRAWINGS MENTIONEI OPERATION
3.	CONTRACT UNDERGRO COORDINA
4.	PROVIDE 2
5.	SEAL ALL C CAPS OR P
6.	Provide (3 Power int
7.	THE GENER DRAWINGS RESPONSIE THE COMPI GENERATC
8.	CONTRACT SIMULATEE TRAINING F START UP /
9.	COORDINA NOTIFICATI MINIMUM. A CONTRACT OWNER FO APPROVED
10.	THERE SHA AND ONE S
	GENERA
1.	IT IS THE C TO ALLOW
2.	THESE DOO DEMOLITIO LIMITS OF V SOLELY ON REQUIRED. RESPONSIE
3.	REMOVE AI EQUIPMEN
4.	CONTRACT RETAINED. ARE IDENT PROPERTY
_	

5. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR FOR ALL CUTTING PATCHING & FINISH WORK.

ANY INTERRUPTED CIRCUIT SHALL BE MADE CONTINUOUS. 6.

GENERAL NOTES - APPLIES TO ALL SHEETS

SEE EACH SHEET FOR ADDITIONAL GENERAL NOTES THAT ARE SPECIFIC TO AN AREA OR SHEET.

TRICAL DRAWINGS AND SCHEDULES ARE FUNCTIONAL IN NATURE AND DO NOT SPECIFY EXACT IS OF EQUIPMENT OR EQUIPMENT TERMINATIONS. IT IS THE INTENT OF THESE DRAWINGS TO DESCRIBE VIDE FOR THE FURNISHING, INSTALLING, TESTING AND PLACING IN FULLY OPERATIONAL CONDITION ALL NT, MATERIALS, DEVICES AND NECESSARY APPURTENANCES TO PROVIDE A COMPLETE ELECTRICAL OGETHER WITH SUCH OTHER MISCELLANEOUS INSTALLATIONS AND EQUIPMENT SHOWN ON THE . THE WORK SHALL INCLUDE ALL MATERIALS, APPLIANCES AND APPARATUS NOT SPECIFICALLY ED HEREIN OR SHOWN ON THE DRAWINGS, BUT WHICH ARE NECESSARY TO MAKE A COMPLETE, FULLY NAL INSTALLATION OF ALL ELECTRICAL SYSTEMS SHOWN ON THE DRAWINGS.

TOR TO PROVIDE A UTILITY LOCATE PRIOR TO DIGGING TO AVOID DAMAGING ANY EXISTING ROUND UTILITIES. LOCATION OF EXISTING UTILITIES SHOWN MAY DIFFER FROM ACTUAL INSTALLATION. ATE DUCT BANKS, VAULTS, AND HAND HOLES WITH EXISTING UTILITIES AND NEW UTILITIES.

200-POUND TENSILE STRENGTH PULL CORD IN ALL SPARE OR EMPTY CONDUITS.

CONDUIT OPENINGS CONTAINING CABLES TO PROTECT WATER AND RODENT INGRESS. PROVIDE END PLUGS FOR ALL UNUSED CONDUITS.

3) DAYS ADVANCE NOTICE AND OBTAIN APPROVAL PRIOR TO ANY POWER DISRUPTION. ALL BACKUP TERRUPTIONS SHALL BE KEPT TO MINIMUM EXTENT POSSIBLE.

ERATOR AND ATS SHALL BE OWNER FURNISHED AND CONTRACTOR INSTALLED. SUBMITTAL AND SHOP S OF THE EQUIPMENT WILL BE PROVIDED TO THE CONTRACTOR. THE CONTRACTOR SHALL BE IBLE FOR OBTAINING ALL PERMITS NECESSARY FOR THE INSTALLATION AND SETTING INTO SERVICE PLETE GENERATOR AND ATS SYSTEM. CONTRACTOR TO ASSIST OWNER WITH OFF LOADING OR AT TIME OF DELIVERY. COORDINATE TIMING WITH OWNER.

TOR SHALL COORDINATE FACTORY START-UP AND TESTING. CONTRACTOR SHALL CONDUCT A D POWER OUTAGE IN THE PRESENCE OF THE OWNER AND ENGINEER AND SHALL INCLUDE 4 HOURS OF FOR THE OWNER IN THEIR BID. CONTRACTOR TO PROVIDE 50 GALLONS OF FUEL FOR GENERATOR AND TESTING.

ATE WITH OWNER AND GENERAL CONTRACTOR FOR FURTHER REQUIREMENTS FOR ADVANCE TION BEFORE ANY SYSTEM SHUTDOWN. ALL SHUTDOWN AND CHANGEOVER TIME SHALL BE KEPT TO A ALL SYSTEM SHUTDOWNS SHALL BE DISCUSSED AND COORDINATED BETWEEN THE GENERAL TOR AND ALL SUBCONTRACTORS. THE CONTRACTOR SHALL SUBMIT AN OUTAGE PROPOSAL TO THE OR APPROVAL. NO SYSTEM SHUTDOWNS WILL BE ALLOWED WITHOUT BEING SCHEDULED AND D IN ADVANCE BY THE OWNER.

ALL BE ONE SHUTDOWN DURING CONSTRUCTION TO CUT OVER TO NEW GENERATOR AND ATS SYSTEM SHUTDOWN AT TIME OF PROJECT COMPLETION DURING THE SIMULATED POWER OUTAGE TEST.

AL DEMOLITION NOTES - APPLIES TO ALL SHEETS

CONTRACTOR'S RESPONSIBILITY TO INCLUDE ALL COSTS ASSOCIATED WITH NECESSARY DEMOLITION / THE NEW CONSTRUCTION SHOWN IN CONTRACT DOCUMENTS.

CUMENTS DELINEATE THE BASIC SCOPE OF WORK FOR THE REMOVAL OF EXISTING MATERIAL. THE ON DRAWINGS AND NOTES ARE PROVIDED WITH THE INTENT TO GENERALLY DESCRIBE AREAS AND WORK. THE CONTRACTOR SHALL BE FAMILIAR WITH THE SITE AND CONDITIONS, AND SHALL NOT RELY IN REVIEW OF THE BIDDING DOCUMENTS IN DETERMINING THE EXTENT OF DEMOLITION WORK COORDINATION OF THESE DRAWINGS WITH REQUIREMENTS FOR CONTRACT WORK IS THE IBILITY OF THE CONTRACTOR.

ALL CABLES, CONDUCTORS, SURFACE RACEWAYS AND APPURTENANCES WHICH SERVE EXISTING NT TO BE DEMOLISHED.

TOR TO REMOVE AND DELIVER TO OWNER ALL DEVICES THAT ARE IDENTIFIED BY THE OWNER TO BE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO ASSURE THAT ALL ITEMS TO BE RETAINED TIFIED PRIOR TO THE START OF DEMOLITION. ALL ITEMS NOT SO IDENTIFIED SHALL BECOME THE Y OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF SITE.

7. UNLESS NOTED OTHERWISE DISCONNECT AND REMOVE ALL DEVICES. MAINTAIN CONTINUITY OF ALL DEVICES AND EQUIPMENT TO REMAIN. PROVIDE JUNCTION BOXES, CONDUIT AND WIRE TO EXTEND EXISTING CIRCUITS TO NEW PANELS AS REQUIRED.



	LEGEND, ABBREVIATIONS	GENERAL NOTES AND	MECHANICAL EQUIPMENT SCH		
RE∖	/ISIONS				
NO.	DESCRIPT	ION		DATE	
-	-			-	
DRA	WN BY:				TL
CHEC	CKED BY:				СТ
PRO	IECT MANA	AGER:			MC
DRA	WING No.	of	T(OTAL	
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DATE: 01-08-25 SUBMITTAL: PERMIT/BID SET PROJECT No. 240-317

SECTION 26 00 00 - ELECTRICAL GENERAL CONDITIONS

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. It is the intention of this division of the specifications and the accompanying drawings to describe and provide for the furnishing, installing, testing and placing in satisfactory and successful operation all equipment, materials, devices, and necessary appurtenances to provide a complete electrical system, together with such other miscellaneous installations and equipment hereinafter specified and/or shown in the plans. The work shall include all materials, appliances and apparatus not specifically mentioned herein or noted on the plans, but which are necessary to make a complete working installation of all electrical systems shown on the plans or described herein. Equipment and devices furnished and installed under other divisions of this specification (or by the Owner) shall be connected under this division. The drawings and specifications are complementary and what is called for in either is binding as if called for in both.
- B. By submitting a bid, the Contractor is acknowledging that they have made a thorough examination of the Contract Documents, existing site and building conditions, and have determined that these documents do sufficiently describe the scope of construction work required under this Contract.
- C. Conform to the General Conditions, Supplementary Conditions, and related work in other Divisions for all work.
- D. Included in Divisions 26 is all work and related items necessary to provide all electrical installations except as specifically excluded. In general, this includes all labor, equipment, tools, etc., to complete the electrical work.

1.02 REFERENCE STANDARDS

A. The work shall comply with the latest edition of the applicable Standards and Codes of the following:

ASTM	American Society for Testing and Materials
NBFU	National Board of Fire Underwriters
NEC	National Electrical Code
	State Electrical Code
NESC	National Electrical Safety Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
U.L.	Underwriters Laboratories Inc.
IPCEA	Insulated Power Cable Engineers Associated
CBM	Certified Ballasts Manufacturers
	Federal, State and Local Building Codes
ETL	Electrical Testing Laboratories
WAC	Washington Administrative Code (WAC 296-46B)

V. If any conflict occurs between Government adopted Code Rules and this specification, the codes are to govern. Nothing in these drawings and specifications shall be construed to permit work not conforming with governing codes. This shall not be construed as relieving the Contractor from complying with any requirements of the plans and specifications which may be in excess of, but not in conflict with, requirements of the Governing Codes.

1.03 SUBMITTALS

- A. Shop Drawing Submittals
- This Contractor shall submit to the Architect as described in Division 01. When shop drawings are submitted electronically, they shall be submitted as described in Paragraph 2 below.
- 2. The Contractor shall submit to the Architect electronic shop drawings in PDF format. Electronic Shop Drawings that are submitted without following the format as outlined below will be returned for corrections without any further review.
 - a. A separate PDF file shall be submitted for each Division including <u>All</u> submittal items for that Division as outlined below:
 - i. Division 26 Electrical
 - b. The contractor shall provide either a digital or hardware method of transporting the electronic submittal to the Architect. Files larger than 10Mg shall not be sent via email and shall be transferred via a file transfer protocol, PC- compatible CD or PC-compatible thumb drive. Divisions shall not be broken up into separate files for transfer via email.
 - c. Each Specification PDF shall be submitted with the following format and salient attributes:
 - i. Cover page including:
 - a) Project Title as indicated on the plans
 - b) Project Location including address, city, state, country
 - c) Prime Contractor name, phone number, and email address
 - d) Sub-Contractor name, phone number, and email address
 - e) Specification Division number and title
 - ii. Index Page outlining each specification section included in the submittal. This list shall be linked to a corresponding Specification Section Divider for each section. This link shall enable the reviewer to jump to a specification section by clicking the item in the list.
 - Specification Section Divider: Shop Drawings shall be divided by specification section and each section shall begin with a divider page outlining the Specification number, title, and a list of submittal items for the section. In the upper right-hand corner of the divider page, a link shall be provided returning the reviewer to the Index Page.
 - iv. Each Submittal Item listed on the Specification Section Divider shall be linked to the specific item being submitted. Each Submittal Item shall be highlighted yellow with a note reference to the specific paragraph giving the submittal requirements.
 - v. Each page of the submittal shall be numbered in the bottom right corner of the page. Page numbering shall be Roman numerals for all pages before the First Specification Section. Each Specification Section page shall be numbered with the Specification Section number, a dash, and the page number in the Specification Section.
 - vi. Specification items shall be specifically highlighted as they apply to the project rather than highlighting an entire product family. Items that do not apply to this project shall be crossed out with a red "X".
 - vii. The PDF file shall not be protected to prevent printing, selecting of text within the document, or extracting of pages from the document.
- 3. Shop drawings shall be submitted complete, at one time, and with each item indexed with dividers and separated per specification section and shall include, at a minimum, the items of equipment listed in each specification shall be provided:
- Within ten (10) working days after the date of the letter rejecting any items of equipment, lighting fixtures, or materials as not in accordance with the specifications, the Contractor shall submit a new list of items to furnish and install in place of those items rejected. If the Contractor fails to submit this new list within the above specified time, or if any items on this second list are rejected as not being in accordance with these specifications, the Engineer may select the items which the Contractor shall furnish and install without change in Contract price or time of completion.
- 5. The acceptance of a manufacturer's name or product by the Engineer does not relieve the Contractor of the responsibility for providing materials and equipment which comply in all details with the requirements of the Contract Documents. The Contractor shall be solely responsible for submitting materials at such a time to allow a minimum of two weeks for Engineer's review.
- Electrical Drawings for the project have been developed by the Engineer using AutoCAD software or newer. These drawing files will be made available to the Contractor for development of shop drawings and/or As-Builts with a signed waiver of responsibility.

As-Built Drawings

- The Contractor shall maintain, in addition to any reference drawings, an as-built set of prints, on which all deviations from the original design shall be drafted in a neat, legible manner with red colored pencil. This red-lined set shall identify all drawing revisions including addenda items, change orders, and Contractor revisions. The Contractor is responsible to revise panel schedules and load calculations as required.
- Drawings shall show locations of all concealed raceway runs larger than 1", giving the number of conductors and size 2. of raceway. Underground ducts shall be shown with cross section elevations. All pipe, raceway, manholes or lines of other trades shall be included.
- The Contractor shall update all references to specific products to indicate products actually installed on project. This 3. shall include, but not be limited to, lighting fixtures, baseboard heaters, etc.
- Upon completion of the Division 26 work, the Contractor shall deliver the pdf marked up drawings to the Engineer for 4. review and approval.
- F. Warranty
- Provide a written warranty that the electrical scope of work is free from mechanical and electrical defects. 1. Contractor shall replace and repair, to the satisfaction of the Engineer, any parts of the installation which may fail within a period of 12 months after the date of substantial completion, provided that such failure is due to defects in material or workmanship, or failure to follow the specifications and drawings.
- D. Wiring Diagrams for each system shall be complete for the specific system installed under the Contract. "Typical" line diagrams will not be acceptable unless properly marked to indicate the exact field installation.

1.04 PERMITS & FEES

A. The Contractor shall obtain and pay for all licenses, permits, and inspections required by laws, ordinances, and rules governing work specified herein. The Contractor shall arrange for inspection of work by the inspectors and shall give the inspectors all necessary assistance in their work of inspection.

1.05 DEFINITIONS

- A. When "provide" is used, it shall be interpreted as "furnishing and installing complete in operating condition".
- B. When "drawings" is used, it shall be interpreted as "all Contract Drawings for all disciplines".
- C. When "Contractor" is used, it shall be interpreted as the Electrical Contractor
- D. When "Electric Scope of Work" is used, it shall be interpreted to include all design documents associated with Divisions 26.

1.06 INTENT OF DRAWINGS

- A. The electrical drawings are intended to serve as working drawings for general layout. The equipment layout is diagrammatic and, unless specifically dimensioned or detailed, does not indicate all fittings, hardware, or appurtenances required for a complete operating installation.
- B. Anything shown on the drawings but not covered in the specifications, or anything covered in the specifications but not shown on the drawings, shall be as if covered in both. In case of conflict between the drawings and specifications, the Engineer will select the method to be used. The Contractor shall be responsible for verifying all measurements before proceeding with the work.
- C. Wiring diagrams are not intended to indicate the exact course of raceways or exact location of outlets. Raceway and outlet locations are approximately correct and are subject to revision as may be necessary or desirable at the time of installation. Precise location in every case shall be subject to the Engineer's approval.

1.07 PROTECTION

A. The Contractor shall store and guard all equipment before installation and shall protect same, and replace any equipment that has been damaged prior to final acceptance.

1.08 HOUSEKEEPING

- A. All electrical materials shall be kept stored in an orderly fashion protected from heat, cold, and the weather.
- B. All marred surfaces shall be refinished and painted after installation.
- C. All debris shall be removed from premises during work, as directed, and at completion of job.

1.09 TEMPORARY USE

A. Temporary or interim use of any and all portions of the electrical system shall be under the supervision of the Electrical Contractor.

1.10 WORK NOT INCLUDED

- A. Indicated motors, controls, and equipment, as described in other divisions, shall be furnished by other trades, but shall be moved, set, and wired to electrical controls and power supply by the Electrical Contractor.
- B. Work to be included under this Contract shall be defined on drawings and in these specifications. Any details beyond these limits are meant only to give installation clarity to that portion which is a part of this Contract.

PART 2 - RODUCTS

2.01 COMPETITIVE PRODUCTS

A. Any reference in the specifications to any article, device, product, material, fixture, form, or type of construction by name, make, or catalog number shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. The Contractor, in such cases, may use any article, device, product, material, fixture, form, or type of construction which, in the judgment of the Engineer, expressed in writing, is equal to that specified. However, any manufacturer not listed as an accepted bidder for a specific item must be submitted for acceptance in writing, and with descriptive data verifying equal quality and performance, at least ten (10) working days prior to the bid date for approval.

2.02 MANUFACTURER/EQUIPMENT PRIOR APPROVALS

- A. Any manufacturer/equipment not listed as an approved substitute for a specified item must be submitted for acceptance in accordance with Division 01, in writing, with detailed information to include:
- Manufacturer's Catalog Data 1.
- 2. Complete Physical and Technical Data
- 3. Wiring Diagrams
- Detailed reference (written or highlighted) noting compliance with the appropriate Specification Section and all 4. applicable Specification item numbers within that Section
- Complete type-written index cross referencing all proposed substitutes and specified items 5.
- Detailed reference to specified items (written or highlighted) noting equal quality and performance of proposed
- substitute equipment Other descriptive data, as required by the Engineer 7.
- B. If substitute material is determined to be acceptable by the Engineer, it will be included in a subsequent Addenda prior to bidding. The acceptance of a manufacturer's name or product by the Engineer does not relieve the Contractor of the responsibility for providing materials and equipment which comply in all details with the requirements of the Contract Documents.
- C. Only materials which are specified or published in addenda as acceptable shall be used.

2.03 MATERIALS

- latest standard design.

2.04 COMPLETE SYSTEM

2.05 NAMEPLATES

system.

- 6.
- 7.

PART 3 - EXECUTION

3.01 GENERAL

- Engineer before any installation begins.
- B. Cutting and Patching:

3.02 COORDINATION

- and finishing.

3.03 REQUESTS FOR INFORMATION (RFI)

incomplete.

3.04 CLEANING AND PAINTING

- and dirt.
- polished.

3.05 DEVIATION

changes.

3.06 PENETRATIONS OF FIRE RATED ELEMENTS

specific fire-rated locations.

3.07 HANGERS AND SUPPORTS

- by Architect/Engineer.

3.08 WORKMANSHIP AND OBSERVATION

- to span separation.

B. All materials must be of the quality herein specified. All materials shall be new, of the best quality, and free from defects. They shall be designed to ensure satisfactory operation and operational life in the environmental conditions which will prevail where they are being installed.

C. Each type of material shall be of the same make and quality. The materials furnished shall be standard products of the manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's

D. All materials shall be U.L. or E.T.L. listed for the purpose for which they are used.

E. Equipment in compliance with U.L. standards but not bearing their label is not acceptable. If the manufacturer cannot arrange for labeling of an assembled unit at the factory, the unit shall be field evaluated per the Washington State Administrative Code (WAC) and the electrical inspector's requirements.

A. All the systems mentioned shall be complete and operational in every detail except where specifically noted otherwise. Mention of certain materials in these specifications shall not be construed as releasing the Contractor from furnishing such additional materials and performing all labor required to provide a complete and operable

A. Provide identifying engraved nameplate on all equipment, including, but not limited to, pull boxes, to clearly indicate its use, area served, circuit identification, voltage, and any other useful data. The following list identifies some of the electrical equipment requiring labels:

Panelboard Labels: Refer to Section 26 24 16.

Switch and Receptacle Labels: Refer to Section 26 27 26.

Motor Starter and Disconnect Labels: Refer to Section 26 28 16.

Special Equipment/Outlet Labels: Refer to Appropriate Sections.

B. Provide nameplates constructed of plastic (black on white) laminated material engraved through black surface material to white sublayer (attach with screws on NEMA 1 enclosures).

A. Careful consideration shall be given to clearances under and over beams, pipes and ducts, to provide proper headroom in all cases. Check drawings to determine heights of all suspended ceilings and size of pipe shafts where raceway and wire-ways shall run. Coordinate installation of Divisions 26 wiring and equipment with Division 23 and other trades. Where insufficient room for proper installation appears, obtain clarification from

Obtain permission from the Architect and/or Owner's Representative prior to cutting. Locate cuttings so they will not weaken structural components. Cut carefully and only the minimum amount necessary. Cut concrete with diamond core drills except where space limitations prevent the use of such drills.

2. All construction materials damaged or cut into during the installation of this work must be repaired or replaced with materials of like kind and quality as original materials by skilled labor experienced in that particular building trade.

A. The Contractor is responsible for accomplishing work contained within Divisions 26. The work shall coordinate with that of the other Contractors and/or other trades doing work in the building. The contractor shall examine all drawings, including the divisions of mechanical, structural, civil and architectural, for construction details and necessary coordination. Specific locations of construction features and equipment shall be obtained from the Contract Documents, field measurements, and/or from the trade providing the material or equipment. No extra costs will be allowed for failure to obtain this information.

B. All conflicts shall be reported to the Engineer in writing before installation for decision and correction.

C. The Contractor will not be paid for work requiring reinstallation due to lack of coordination or interference with other Contractors or trades. This includes, but is not limited to, removing, replacing, relocating, cutting, patching,

D. The Contractor shall review the installation manual for each device to be installed. If a conflict appears to occur between the manufacturer's recommended installation practices and the plans or specifications, notify the Engineer immediately. Final determination shall be by the Engineer. The Contractor will not be paid for reinstallation due to failure to comply with manufacturer instructions or design documents.

A. It is our intent to provide a timely response for RFIs regarding Division 26 Work. To further expedite this process, where a suggestion can be determined or derived at by the initiator of the RFI, it is required this suggestion be supplied with the submitted RFI. If no suggestion is given where one is possible, the RFI will be returned as

A. All equipment, whether exposed to the weather or stored indoors, shall be covered to protect it from water, dust

B. After installing, all metal finishes shall be cleaned of all dirt, rust, cement, plaster, grease, and paint and shall be

A. Deviation from the shop drawings in construction or installation of equipment shall not be made unless Shop Drawings showing proposed deviations are submitted to and approved by the Engineer. If any equipment is furnished under this or other divisions with current, voltage, or phase ratings that differ from those shown on the drawings, the Contractor shall notify the Engineer in writing immediately and shall not connect said equipment until instructed as to required changes by the Architect. No extension of time will be granted as a result of such

A. Penetrations of fire-rated elements must be made such as to retain that rating. See architectural sheets for

A. Provide hangers, brackets, and suspension rods and supplementary steel to support equipment.

B. Hangers provided under other divisions shall not be used for support of Division 26 equipment, unless permitted

A. Workmanship shall be of the best quality and none but competent workers shall be employed under the supervision of a competent foreman. All completed work shall represent a neat, professional appearance.

B. All work and materials shall be subject to observation at any and all times by representatives of the Engineer.

3.09 SEISMIC BRACING FOR ELECTRICAL EQUIPMENT

A. Provide complete seismic anchorage and bracing for the lateral and vertical support of conduit and electrical equipment, as required by the International Building Code.

3. Conduits that cross seismic separations shall be installed with flexible connection suitable to accommodate conditions. Secure raceways on each side of a separation and provide a minimum of 36" length of flexible conduit

A Division of TranSystems	6021 12th Street East, Suite 200 Fife, Washington 98424 T: 253.922.0446 F: 253.922.0896
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FEDERAL WAY PUBLIC SCHOOLS DECATUR HIGH SCHOOL	WELDING AREA 2800 S.W. 320TH STREET FEDERAL WAY, WA 98023
ELECTRICAL SPECIFICATIONS	
	DATE -
CHECKED BY:	CT
PROJECT MANAGER: DRAWING No.	of TOTAL

DATE: 01-08-25

PROJECT No. 240-317

SUBMITTAL: PERMIT/BID SET

SECTION 26 00 05 - ELECTRICAL - EXISTING SYSTEMS

PART 1 - GENERAL

- 1.01 WORK INCLUDED
- A. Portions of the existing electrical lighting, power and signal systems are to be removed as detailed on the drawings.

1.02 RELATED DOCUMENTS

A. Section 26 00 00 - Electrical General Conditions

1.03 REFERENCE STANDARDS

Not applicable

1.04 SUBMITTALS

Not applicable

PART 2 - PRODUCTS

2.01 EXISTING MATERIALS

- A. Existing materials which are a part of the building shall remain the property of the Owner, unless directed by the Owner to be removed.
- B. It is the Contractor's responsibility to include in the bid all costs associated with necessary demolition to allow new construction shown in the Contract Documents, unless specifically noted otherwise. The Contractor shall remove all existing receptacles, lighting fixtures, low voltage devices, backboxes, abandoned raceways, conductors, and any auxiliary items to allow for new construction and finish work to occur as complimented by the Contract Documents.
- C. Contractor is responsible for removal of electrical connections, disconnect switches, and starters for all mechanical equipment scheduled to be demolished. The Contractor shall check all demolition plans and actual field conditions for unit locations.
- D. Areas not included in the scope of work or not included as part of the phasing schedule shall remain fully operational.

2.02 EXISTING MATERIALS NOT TO BE RE-INSTALLED

- A. In coordination with the Architect/Engineer, these materials shall be made available for inspection and decision as to whether the Owner will retain possession. Items selected for retention shall be delivered to a location on the premises selected by the Owner and subsequently turned over to the Owner. Take reasonable care to avoid damage to this material. If the Contractor fails to conform to this requirement, they shall purchase and turn over to the Owner replacement materials of like kind and quality.
- All material not selected for retention by the Owner and debris shall be disposed of by the Contractor. This shall include, but not be limited to, removal of PCB-type ballasts and fluorescent lamps, which shall be disposed of in accordance with EPA requirements.

PART 3 - EXECUTION

3.01 EXISTING CONDITIONS

- A. Examine the structure, building, and conditions under which Division 26 work is to be installed for conditions detrimental to proper and timely completion of the work. Do not proceed with work until deficiencies encountered in installation have been corrected. Report any delay or difficulties encountered in installation of Divisions 26 work which might be unsuitable to connect with work by other divisions of this specification. Failure to report conditions shall constitute acceptance of other work as being fit and proper for the installation of Divisions 26 work.
- Electrical Contractor to provide circuit tracing of all existing circuits in all areas that are to remain, be reused, and/or Β. relocated to new panels.
- C. Maintain continuity of existing circuits of equipment to remain. Existing circuits of equipment shall remain energized. Circuits which are to remain but were disturbed during demolition shall have circuits, wiring, and power restored back to original condition.
- D. This is an occupied facility. The Electrical Contractor is responsible to maintain full operation of all systems in the occupied portions of the facility.

3.02 DEMOLITION

- A. Switchboards, panelboards, signaling systems, other electrical equipment free standing (or surface mounted), raceway (exposed) and conductors no longer in service as a result of this Contract shall be removed. Unused raceways or sleeves shall be cut flush at ceiling, floor or wall and filled with grout.
- B. At the completion of the project, the end product shall have a finished appearance. All abandoned or temporarily utilized material shall be removed.

3.03 NEW DEVICES IN REMODEL AREAS

A. Provide surface mounting for devices on existing walls. Where existing boxes are indicated to be reused, extend box as necessary and provide new devices and plates.

3.04 EXISTING PANELBOARD

- A. Any modifications made to existing panels must be incorporated into the existing circuit index on the panel. If more than three circuits are modified, a new typewritten index incorporating the changes to the existing index shall be installed in the existing panel.
- Listing shall match circuit breaker arrangements, typically with odd numbers on the left and even numbers on the right. Room numbers used shall be final room numbers used in the building, as verified with the Owner.

SECTION 26 22 13 - DRY TYPE TRANSFORMERS

PART 1 - GENERAL A. 1.01 WORK INCLUDED A. When shown on drawings, provide dry type transformers complete. Transformers shall be UL listed and comply with NEMA Standard ST-20. 2.03 WINE A. NEMERAL A.	
 A. When shown on drawings, provide dry type transformers complete. Transformers shall be UL listed and comply with NEMA Standard ST-20. A. 1.02 REFERENCE STANDARDS 	Steel panel enc Cooling and terr
A.	DINGS
	Separate prima operation at rat
A. The work shall comply with the latest edition of the applicable Standards and Codes.	built to resist the
B. 10 CFR 431, Subpart K - Energy Efficiency Program for Certain Commercial and Industrial Equipment - Distribution Transformers; Current Edition.	Core coil shall b having low hyste
C. ANSI C57.12.01/NEMA ST-20: General Requirements for Distribution, Power, and Regulating Transformers.	and configured of 3 and a maxir
D. ANSI/NETA MTS-2019 Standard for Maintenance Testing Specifications for Electrical Power Equipment and Systems.	of 4.
E. IEEE C57.94 - IEEE Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type 2.04 PRIM	ARY TAPS
Distribution and Power Transformers.	Four full capaci
F. IEEE C57.96 - IEEE Standard Guide for Loading Dry-Type Distribution and Power Transformers.	

- G. NECA 1 Standard for Good Workmanship in Electrical Construction.
- H. NECA 409 Standard for Installing and Maintaining Dry-Type Transformers.
- I. NEMA ST-20: Dry-Type Transformers for General Applications.
- J. NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum).
- K. NETA ATS Acceptance Testing Specifications for Electrical Power Equipment and Systems.
- L. NFPA 70 National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

M. Transformers shall be Energy Efficient compliant and meet the following requirements:

- 1. Energy Policy Act of 2005
- 2. DOE 10 CFR 429 Certification, Compliance, and Enforcement for Consumer Products and Commercial and Industrial Equipment
- 3. DOE10 CFR 431 Energy Efficiency Program for Certain Commercial and Industrial Equipment.
- N. UL 506 Standard for Specialty Transformers; Current Edition, Including All Revisions.
- O. UL 1561 Standard for Dry-Type General Purpose and Power Transformers; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. Product Data
- 1. Transformers (Dry Type)
- B. Shop Drawings
- 1. Transformers (Dry Type)
- C. O&M Manuals
 - 1. All Information from Previous Submittals
 - 2. Mfg. Maintenance Manual
 - 3. Recommended Maintenance Procedures

1.04 PRODUCT DATA

- A. The contractor shall include product data identifying compliance with all pertinent items of Part 2 of this specification. All pertinent options shall be identified in the product data submittal. If options have not been identified clearly, the submittal will be rejected.
- B. Provide transformer specifications with included options and manufacturers product data sheets for the submitted transformer. The selected features and options for each transformer shall be clearly identified. Optional items which are not applicable shall be clearly identified for each transformer (e.g., crossed out).

1.05 SHOP DRAWINGS

A. Prepare and submit for review prior to manufacture; include dimensioned front plan and section views, wiring and connection diagrams and bolting template. Contractor shall indicate on the drawings, mounting methods and connection lugs required.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. General Electric
- B. Square D Schneider Electric.
- C. Eaton.
- D. Siemens.
- E. Similar units by Cutler-Hammer, Acme or Hevi-Duty may be utilized if the core and coil assembly is mounted on rubber isolation pads.

2 02 CABINET

RY TAPS

our full capacity taps, minimum of two 2-1/2 percent above and two 2-1/2 percent below normal (rated)

2.05 CONNECTIONS

- 2.06 NOISE LEVEL

2.07 VIBRATION ISOLATORS

PART 3 - EXECUTION

3.01 MOUNTING

- safety factor.

3.02 CONNECTIONS

eel panel enclosure over core, coil, and terminal chamber with louvered openings for convection cooling. cooling and terminal access shall be possible with both sides and rear of enclosure obstructed.

eparate primary and secondary. Windings shall have Class H insulation and shall be rated for continuous peration at rated KVA with temperature rise of not over 150 degrees C above a 40 degree C ambient, with a naximum hot spot temperature of 220 degrees C. Windings and core and coil assembly shall be treated and uilt to resist the effects of dirt and moisture.

Core coil shall be mounted on rubber isolation mounting pads. Cores shall have a common core construction aving low hysterisis and eddy current losses grounded to the transformer core. The neutral bus shall be sized nd configured for at least 200% of the secondary full load current. Transformer impedance shall be a minimum f 3 and a maximum of 5%. The transformer shall be UL listed and suitable for non-sinusoidal loads with a K factor

A. Unless noted otherwise, three phase transformers shall have a 480-volt delta connected primary and 208Y/120-volt, three phase, four wire connected secondary, single phase transformers shall be 480-volt primary, 120/240 volt secondary. Provisions for external connections shall be made by means of a terminal board employing lugs conforming which are compatible with the external conductors installed. (Note: aluminum conductors require special lugs.) All connections shall be accessible for front and top of cabinet.

A. Noise level shall not exceed ANSI Standard C89.2 sound levels of 45 db for sizes less than 51 KVA, 50 db for 51-150 KVA, 55 db for 151-300 and 60 db for greater than 300 as measured by NEMA ST20.

A. The following are options that the Contractor may utilize for the vibration isolators:

Spring vibration isolators shall be B-Line model HMT or equal with neoprene top and base.

2. **Vibration pads** shall be cork, neoprene, and steel construction, B-Line model CNNK or equal.

Neoprene pad spacers shall be B-Line model NNP or equal.

A. Transformers shall be attached to the building structure to prevent overturning in the event of earthquake. All attachment nuts to have washer and rubber pad spacer under them. Provide neoprene pad spacers under mounting rails. Transformers shall be mounted on floor, wall or suspended from ceiling as noted in the contract documents or as required. Remove all shipping blocks prior to installation.

B. Transformers with enclosures designed for floor mounting where suspended from ceiling shall be suspended on a trapeze constructed of a minimum of two horizontal structural channels hung from threaded rods attached to structural members or inserts in structural slab. Channel, rod, and inserts shall be sized for not less than 400% load

C. Transformers shall be installed with four spring vibration isolators, one at each corner, when any of the following conditions are present. Size each isolator for the full transformer weight.

1. Transformer is 45 KVA or larger.

2. Transformer is located higher than one floor above grade.

3. Transformer is noted "SIM" in the contract documents.

D. All transformers mounted directly on a wall shall be mounted with vibration pads sized to give 400% safety factor.

A. 208/120-volt three phase secondary transformers shall be considered "grounded neutral separately derived systems" and be grounded per code accordingly.

B. Transformer raceway connections shall be flexible metal raceway. See Specification Section 26 05 33.

C. Voltage Tap Connection: Connect all transformers at "normal" tap. After facility is completely energized, measure secondary voltages at all transformers and service switchboard. Forward a list to the Architect/Engineer for evaluation. Include copy in O&M Manuals. Reconnect taps as subsequently directed. All costs associated with this work shall be included in base bid

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FEDERAL WAY PUBLIC SCHOOLS DECATUR HIGH SCHOOL WELDING AREA	2800 S.W. 320TH STREET FEDERAL WAY, WA 98023
ELECTRICAL SPECIFICATIONS	
NO. DESCRIPTION - -	DATE -
DRAWN BY:	TL
CHECKED BY:	СТ
PROJECT MANAGER:	MC

DRAWING No. of TOTAL

DATE: 01-08-25 SUBMITTAL: PERMIT/BID SET PROJECT No. 240-317

SECTION 26 24 16 - PANELBOARDS

PART 1 - GENERAL

- A. WORK INCLUDED
- B. Provide all panelboard equipment, complete; dead front type.

1.02 SUBMITTALS

- A. Product Data
- 1. Panelboards
- B. Shop Drawings
- 1. Panelboards
- C. O&M Manuals
 - 1. All Information from Previous Submittals
 - Mfg. Maintenance Manual
 - 3. Recommended Maintenance Procedures

1.03 PRODUCT DATA

- A. The contractor shall include product data identifying compliance with all pertinent items of Part 2 of this specification. All pertinent options shall be identified in the product data submittal. If options have not been identified clearly, the submittal will be rejected.
- B. Provide panelboard specifications including all main and branch breaker sizes and ratings, metering components including CTs and PTs, surge protective devices and any other equipment included within the panelboard assembly. All features to be included with each panelboard shall be clearly indicated. If selected features are not indicated, the submittal will be rejected.

1.04 SHOP DRAWINGS

- A. Provide panelboard one_line drawing showing main connection and bussing
- B. Provide panelboard dimension drawings including but not limited to bussing, breaker sizes and locations, bus ratings, enclosure information and associated equipment information.

PART 2 - PRODUCTS

2.01 PANELBOARD TYPE

- A. Panelboards shall be rated at proper voltage and current for intended use with busbars of copper or aluminum. Panels shall be 3_phase, 4_wire, 100% neutral, unless noted otherwise. Where aluminum is utilized, all lugs shall be of an approved compression type. Provide multiple lugs where conductors in parallel or "feed through" are shown on the Drawings.
- B. Conductor Connectors shall be bolted to busbars using Grade 5 bolts and Belleville washers. Feeder conductor connectors shall be rated for 75 Degree C. wire when 75 Degree C. wire is indicated. Where aluminum conductors are utilized for feeders or branch circuits the connectors shall conform with Section 26 05 19.
- C. Panelboards shall have a separate ground bus bonded to the panelboard frame.
- D. Where 120_Volt, 15_ or 20_Amp breakers are intended for switching loads they shall be of type rated for switching duty labeled "SWD."

2.02 ACCEPTABLE MANUFACTURERS

- A. ABB
- B. Square_D
- C. Siemens
- D. Cutler Hammer

2.03 CIRCUIT BREAKERS

- A. The following minimum interrupting capacity apply to circuit breakers:
- 1. 10,000 AIC Symmetrical for 208Y/120V
- 2. 14,000 AIC Symmetrical for 480Y/277V

Other ratings shall be as specified on panel schedules shown on the Drawings. Series rating of breakers is not allowed.

- B. Mount breakers in all panelboards so that breaker handles operate in a horizontal plane. Bolt in type only. Provide common trip on all multiple pole breakers.
- C. Where noted, provide spare breakers, complete for future connection of wiring circuits. Where "Space" is indicated for breakers, provide all bussing and breaker mounting hardware in the panelboard, provide steel knockouts in dead front metal closure of unused part of panel. If any steel knockouts are removed, provide breakers in such spaces or approved cover plates. Open spaces are not permitted.
- D. For multi_wire branch circuits, provide approved breaker handle ties where required by NEC 210.4.

2.04 CABINET FOR EACH PANELBOARD

- A. Flush or surface, as indicated; tight closing doors without play, when latched. Where two cabinets are located adjacent to each other in finished areas, provide matching trim of the same height. Where a remote controlled switch or contactor is mounted in any panelboard, mount on same frame as panelboard interior with screw retained access door in dead front shield; common door over circuit breakers and remote controlled device. Where flush mounted, provide (2) 3/4" conduits to accessible ceiling space for future expansion.
- B. All conduits for future expansion shall stub into a junction box, where located above grade, and shall be sealed in the panel.
- C. Provide cabinets of sufficient dimensions to allow for future expansion and addition of circuit breakers within the panelboards as indicated on panel schedules.
- D. Provide cabinet front with full_height hinged door. One door over the interior and an additional hinged dead front cover over interior and wireway (door_in_door). Full_height front cover hinged to box with concealed trim clamps. Provide flush door locks.
- E. Provide lock for each cabinet door. All Electrical Distribution Equipment Locks shall be keyed identically. Key system shall match existing. Supply Owner with minimum six keys.
- F. Fasten panelboard front with machine screws with oval counter_sunk heads, finish hardware quality, with escutcheons or approved trim clamps. Clamps accessible only when dead front door is open are acceptable. Surface mounted panelboards with fronts greater than 48 inches vertical dimension shall be hinged at right side in addition to hinged door over dead front.
- G. Finish: Provide factory prime coat for cabinets to be located in finished areas. Where cabinets are located in unfinished areas, standard lacquer or enamel finish, gray or blue_gray color, shall be substituted for factory prime coat.

2.05 SYSTEM OF NUMBERING AND BUS ARRANGEMENT

A. Shall be as shown on the Panel Schedules on the Drawings.

2.06 PANELBOARD NAMEPLATE

- A. Provide engraved and filled (or color layer engraved through outer layer) plastic nameplate with ½ inch high characters (for panel name); attached with screws to each NEMA 1 panelboard front. White on black, include voltage, phases, wires and minimum A.I.C. Rating in 3/8_inch characters.
- B. Nameplate color shall be:
- 1. Normal System: White letters on black

PART 3 - EXECUTION

3.01 MOUNTING

A. Secure in place with top of cabinet at 6'_0", unless otherwise noted. Top of cabinet and trim shall be level. Firmly anchor cabinets directly or with concealed bracing to Building Structure. When panels are not located in or directly on a wall, provide a support frame of formed steel channel which is anchored to the floor and Ceiling Structure. Interiors shall not be installed until Structure is totally enclosed. Where panels are mounted adjacent to each other, the top edges shall be at the same height.

3.02 CIRCUIT INDEX

A. For each branch circuit panelboard provide a typewritten index listing each circuit in the panelboard by number with its proper load designation. Mount with a transparent protective cover inside cabinet door. Listing shall match circuit breaker arrangements, typically with odd numbers on the left and even numbers on the right. Room numbers used shall be final room numbers used in the building as verified with the Owner, and not room number assigned on Plans.

3.03 CABINET PAINTING

A. Cabinets furnished as prime painting shall be field painted to match color of adjacent wall. (See Division 09 _ Painting).

3.04 SPACE

A. Verify space available with equipment sizes and Code Required Working Clearances prior to Submittal of Shop Drawings.

3.05 GROUNDING

A. Provide separate ground busbar for all panels supplying isolated ground circuits.

3.06 FEED THROUGH AND DOUBLE LUGS

A. Provide feed through or double lugs with amperage equal to the incoming feeder amperage unless shown as larger.

3.07 TESTING

- A. Perform visual and mechanical assessment including but not limited to verification of manufacturers installation instructions, verification of grounding in agreement with the contract documents and applicable codes and standards, and proper mounting of equipment to the floor or pad.
- B. Torquing requirements and installation of all terminations 1,000 amps and above shall be certified by an independent testing agency.
- C. All breakers with adjustable trip settings shall be set as recommended by the coordination study. These settings shall be verified and tested by an independent testing agency.

PART 1 - GENERAL 1.01 WORK INCLUDED

1.02 SUBMITTALS

- A. Product Data
- 2. Device Plates
- 3. Labels B. O&M Manuals

1.03 PRODUCT DATA

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

2.02 RECEPTACLES

- code.

2.03 DEVICE PLATES

Α.	Interior:	Ρ
	screws sł	າດ
	size to fit	е

2.04 LABELING

PART 3 - EXECUTION

3.01 MOUNTING

3.02 ORIENTATION

3.03 DEVICE PLATES

A. Shall be stainless steel for each new wiring device and for each telephone and signal equipment outlet, except where equipment mounted thereon covers the outlet box completely.

3.04 RECEPTACLE GROUNDING

A. Provide bare bonding wire between receptacle grounding terminal and box. Plaster ear screws connecting frame to the box will not be acceptable for grounding.

SECTION 26 27 26 - SWITCHES AND RECEPTACLES

A. Provide all wiring devices and plates.

1. Receptacles

1. All Information from Previous Submittals

A. The contractor shall include product data identifying compliance with all pertinent items of Part 2 of this specification. All pertinent options shall be identified in the product data submittal. If options have not been identified clearly, the submittal will be rejected.

B. Provide product data for each switch and receptacle utilized on the project. The product data shall be provided for each type and include but not be limited to device ratings, color, and suitable uses.

C. Provide product data for each device plate utilized on the project. The product data shall be provided for each type and include but not be limited to color and suitable uses.

A. Push-in terminals are not allowed.

B. All devices color shall be white, unless otherwise noted.

A. Provide "Industrial Specification Grade", tamper-proof, duplex NEMA 5-20R configuration (20-Amp, 120-Volt) unless shown otherwise. Must have "rivetless ground" contact manufactured as an integral component of the external ground screw terminal.

B. Self-Testing Ground-Fault Circuit-Interrupter (GFCI) Duplex Receptacles: 20A. 125V AC; 2-pole, 3 wire grounding; 10,000 amps current interrupting; green light indicator when power is 'on'; red light indicator when device is in the tripped position; Red "EOL" (end of life) indicator with rapid flash when the unit has reached end of life and/or cannot provide GFCI protection. Provide GFI receptacles where required by

C. Special Purpose Receptacles: For special purpose receptacles, see drawings for voltage, amperage, and phase. Provide with matching plug delivered to the Owner.

> Plates for recessed boxes shall be Hubbell and Cooper Type 302 stainless steel. Attachment all match finish of plate. Plates for surface mounted boxes shall be of pressed stainless steel with exactly the box used.

A. For NEMA 5-20r receptacles, each device shall be identified with a clear label with black typing stating the panel & circuit number.

B. For receptacles other than NEMA 5-20R, the coverplate shall have ampere rating, voltage and phase engraved on a phenolic label and attached to the cover plate.

A. Rigidly fasten each device to the outlet box at proper position with the wall to bring receptacle flush with plate or switch handle the proper distance through the plate.

A. Set Receptacles vertical with ground slot down at +18" above finished floor.

B. Provide new covers on existing outlet boxes being reused.



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REUSE OF DOCUMENTS THE DRAWINGS AND SPECIFICATIONS CONTAINED HEREIN ARE THE PROPRIETARY, UNPUBLISHED PROPERTY OF BCE ENGINEERS AND SHALL NOT BE REPRODUCED, COPIED, OR DISCLOSED IN WHOLE OR PART WITHOUT THE WRITTEN PERMISSION OF BCE ENGINEERS.

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DATE: 01-08-25

PROJECT No. 240-317

SUBMITTAL: PERMIT/BID SET

SECTION 26 28 13 - FUSES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide all fuses as required. Provide three (3) spare of each size and type required. Fuses shall not be installed until equipment is ready to be energized. This measure prevents fuse damage during shipment of the equipment from the manufacturer to the jobsite or from water that may contact the fuse before the equipment is installed. Final tests and inspections shall be made prior to energization of the equipment. This shall include a thorough cleaning, tightening, and review of all electrical connections and inspection of all grounding conductors. All fuses shall be furnished by the Electrical Contractor. All fuses shall be of the same manufacturer.

1.02 SUBMITTALS

- A. Product Data
- 1. Fuses
- B. O&M Manuals
- 1. All Information from Previous Submittals

1.03 PRODUCT DATA

A. The contractor shall include product data identifying compliance with all pertinent items of Part 2 of this specification. All pertinent options shall be identified in the product data submittal. If options have not been identified clearly, the submittal will be rejected.

PART 2 - PRODUCTS

2.01 MAINS, FEEDERS, AND BRANCH CIRCUITS

- A. Circuits 0 to 600 amperes shall be protected by current limiting BUSSMANN LOW-PEAK Dual-Element Fuses LPN-RK (250 volts) or LPS-RK (600 volts). All dual-element fuses shall have separate overload and short-circuit elements. Fuse shall incorporate a spring activated thermal overload element having a 284°F. melting point alloy and shall be independent of the short-circuit clearing chamber. The fuse must hold 500% of rated current for a minimum of 10 seconds and be listed by Underwriters Laboratories, Inc., with an interrupting rating of 200,000 amperes r.m.s. symmetrical. The fuses shall be UL Class RK1 to maintain the Engineered protection of the system components.
- B. Motor Circuits: All individual motor circuits with full load amperes ratings (FLA) of 480 amperes or less shall be protected by BUSSMANN LOW-PEAK Dual-Element Fuses LPN-RK (250 volts) or LPS-RK (600 volts). Larger H.P. motors shall be protected by BUSSMANN Type KRP-C Low-Peak Time-Delay Fuses of the ratings shown on the drawings. All other motors, (such as 1.0 service factor motors) shall be protected by BUSSMANN LOW-PEAK Dual-Element Fuses LPN-RK (250 volts) or LPS-RK (600 volts) installed in ratings of approximately 115% of the motor full load current except as noted above. The fuses shall be UL Class RK1 Dual Element Time Delay or Class L.

2.02 SPARE FUSES

A. Spare fuses shall be provided with a minimum of three of each ampere rating.

2.03 ACCEPTABLE MANUFACTURERS

- A. Bussman
- B. Little Fuse

PART 3 - EXECUTION

3.01 FUSES

A. Install in all fusible devices provided under this Contract.

SECTION 26 28 16 - DISCONNECTS AND FUSED SWITCHES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provided all disconnects, fused and unfused, required by code for equipment furnished under this and other divisions of these specifications and as shown on the drawings.

B. Product Data

- 1. Disconnect and Fused Switches
- C. Shop Drawings
- 1. Disconnect and Fused Switches
- D. O&M Manuals
- 1. All Information from Previous Submittals

1.02 PRODUCT DATA

A. The contractor shall include product data identifying compliance with all pertinent items of Part 2 of this specification. All pertinent options shall be identified in the product data submittal. If options have not been identified clearly, the submittal will be rejected.

1.03 SHOP DRAWINGS

A. Provide shop drawings for the equipment provided, including, but not limited to door swings, clearances, dimensions, mounting, and other applicable items.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. General Electric
- B. Square-D
- C. Siemens

D. Cutler-Hammer

2.02 DISCONNECTS

- A. Switch shall be heavy-duty type, shall be quick-break and shall be horsepower rated. Switch shall have blades as required to open all ungrounded conductors and shall be single throw unless noted.
- B. Enclosure shall have interlocking cover to prevent opening door when switch is closed. Door interlock shall include a defeating scheme, shall be padlockable in the "Off" position.
- C. Enclosure shall be suitable for environment in which mounted. All exterior enclosures shall have a minimum raintight rating.

2.03 FUSED SWITCHES (OR FUSED DISCONNECTS)

- A. Shall be as above with addition of fuse space and clips to accept only fuses as noted in Section 26 28 13.
- B. Fuses shall be provided in all fused disconnects.
- C. Fuses shall be sized in accordance with manufacturer's requirements of protected equipment.

2.04 NAMEPLATES

A. Provide nameplates on all enclosures and include the following information: Load served, voltage, phase, panel and circuit number. Construct and attach in accordance with Section 26 00 00.

PART 3 -EXECUTION

3.01 SUPPORTS

A. Secure solidly to wall or approved mounting frame. Disconnects supported only by Raceway are not acceptable.

3.02 SPLICES

A. Wiring space within enclosure shall not be used as a junction box.

3.03 INSTALLATION

- A. All material installation shall be in accordance with manufacturers' recommendations and the provisions of applicable codes.
- B. Fuses shall not be installed until equipment is ready to be energized.









CONSTRUCTION NOTES

PROVIDE AN INTEGRATED POWER SYSTEM CURRENT (1)

- GUARD SPD WITH THE FOLLOWING: - L-N, L-G, N-G: 60,000A PER MODE.
- COMPONENT LEVEL FUSING.
- MONITOR:
- * STATUS INDICATOR LIGHTS.
- * AUDIBLE ALARM WITH RESET. * SERVICE INDICATOR LIGHT.



6021 12th Street East, Suite 200 Fife, Washington 98424 T: 253.922.0446 | F: 253.922.0896

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Division

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	PANEL: LOC: TYPE:	HP1A _ SECT 2 (EXISTING) EXISTING SHOP AREA NEMA 1; FED FROM SECT 1	<u>3</u>	PH N	4 IOUNT: POLES:	WIRE SURFACE 24		VOLTAGE: FEED: SF MAINS:	480Y/2 BOTT	277V OM		
LOAD			CIR.	CIR.	BRKR				CIR.	BRKR	CIR.	
T YPE	LOAD	CIRCUIT DIRECTORY	NO.	Р	AMP	A	В	С	Р	AMP	NO.	c
												SPACE
		SPACE	1								2	SPACE
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		PANEL AS1-AUTO SHOP	3								4	POTTERY
					200							
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			= 0.00		MO OTU	WATER HEATER	(5(100%) = 0.0)			MISC(100%) = 0.00	T(

NOTES:	L=LIGHTING, R=RECEPTACLES, H=ELECTRIC HEAT, ML=LARGEST MOTOR, MO=OTHER MOTORS, WH=WATER HEATERS, K=KITCHEN LOADS, A=AF
	D=DEDICATED, X=MISC, SF=SUB FEED

	PANEL:	HP1A_SECT 2 (EXISTING) REVISED	3	PH	4	WIRE		VOLTAGE:	480Y/2			
	LOC:	OC: EXISTING SHOP AREA		Ν	IOUNT:	SURFACE		FEED:	BOTT	DM		
	TYPE:	NEMA 1; FED FROM SECT. 1		l	POLES:	24		SF MAINS:				
LOAD			CIR.	CIR.	BRKR				CIR.	BRKR	CIR.	
T YPE	LOAD	CIRCUIT DIRECTORY	NO.	Р	AMP	A	В	С	Р	AMP	NO.	
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		SPACE	1								3	SPACE
											5	SPACE
				3					3		7	
		AUTO SHOP	3	-							9	POTTERY
					200						11	
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		RECEPTS TOT	AL = 0.00			MOTOR 1	FOTAL = 1056.0	0 D	EDICATED	(100%) = 2	20760.00	
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	NOTES:	L=LIGHTING, R=RECEPTACLES, H=ELECTRIC HEAT, MI	_=LARGES	T MOTOR	, MO=OTHI	ER MOTORS, WH	H=WATER HEAT	FERS, K=KITCHEI	N LOADS, A	A=APPLIAN	CES,	
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500 AMPS MCB 600 AMPS BUS 22,000AIC MINIMUM			PANEL: LOC: TYPE:	WP (NEW) WELDING ROOM NEMA 1	<u>1</u>	PH N	3 IOUNT: POLES:	WIRE SURFACE 42	VOI SF	TAGE: FEED: MAINS:	120/240 BOTT)V	200 AMPS 200 AMPS 22,000AIC	MCB BUS Minimum				
CIRCUIT DIRECTORY LOAD	TYPE	LOAD T YPE	LOAD		CIR. NO.	CIR. P	BRKR AMP	A	В	CIR. P	BRKR AMP	CIR. NO.	CIRCUIT DIRECTORY	LOAD	LOAD T YPE			
		Х	1920	WELDER	1	2		3840		2		2	WELDER	1920	X			
E		X	1920		3		50	0400	3840		50	4		1920				
			1200		5	1	20G	2400	2400	1	20G	6 8		1200				
ERY EF - 402			1920		9	2	200	3840	2400	2	200	0 10	WELDER	1920				
		X	1920		11	-	50	0010	3840		50	12		1920	X			
E		D	1200	DED RECEPT (NOTE 1)	13	1	20G	2400		1	20G	14	DED RECEPT (NOTE 1)	1200	D			
		D	1200	DED RECEPT (NOTE 1)	15	1	20G		2400	1	20G	16	DED RECEPT (NOTE 1)	1200	D			
-		X	1920	WELDER	1/	2	50	3840	2010	2	50	18	WELDER	1920				
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		D	1200	DED RECEPT (NOTE 1)	23	1	20G		2400	1	20G	24	DED RECEPT (NOTE 1)	1200	D			
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F			1200		29	1	20G	2400	2400	1	20G	30		1200				
-			1560	POWDER COAT MACHINE (NOTE 1)	33	1	20G	1560	2400	1	200	34	SPARE	1200				
		MO	360	FE-1 THRU 6	35	1	200	1000	708	2	20	36	EF-321	348	мо			
E					37	3		348		-	20	38		348	МО			
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TOTAL				LIGHTING(125%) = 0.00				26868	25668	-			TOTAL CONNECTED LOAD (VA):	52,536.00				
TOTAL CONNECTED LOAD (VA):				RECEPTS<=10000(100%) = 0.00		LARC	SEST MOTO	DR(125%) = 0.00			OADS(65%)) = 0.00	TOTAL CONNECTED CURRENT (A):	218.90				
OTAL CONNECTED CURRENT (A):				RECEPTS>10000(50%) = 0.00 RECEPTS TOTAL = 0.00		OTHER	MOTORS(MOTOR T	100%) = 1056.00 OTAL = 1056.00	D	APPLIAN(EDICATED(CES(100%) (100%) = 20) = 0.00)760.00		40.248.00				
TOTAL DEMAND LOAD (VA):				ELECTRIC HEAT(100%) = 0.00		WAT	ER HEATER	RS(100%) = 0.00		MISC	C(60%) = 18	3432.00	TOTAL DEMAND CURRENT (A):	167.70				
TOTAL DEMAND CURRENT (Á)			NOTES:	L=LIGHTING, R=RECEPTACLES, H=ELECTRIC HEAT, ML=I D=DEDICATED. X=MISC. SF=SUB FEED	LARGES	T MOTOR	, Mo=othe	ER MOTORS, WH	=WATER HEAT	ERS, K=KIT(CHEN LOAD	DS, A=A	APPLIANCES,					
500 AMPS MCB 600 AMPS BUS				FWPS - DECATUR H	S W			HOP	FET				FWPS - DE		HS V	VELDING SH	OP	ЧЕЕТ
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CIRCUIT DIRECTORY LOAD				NEC 220.87 AND WA	C 29	6-46B-	900(3)	j)					NEC 220.	87 AND V	VAC 2	96-46B-900(3)(j)		
				30 day domand study fro	m ·	0/10	12024	to	10/11/202	٨			30 day dama	nd study f	from ·	0/10/2024	to	10/11/2024
				Phase to Phase Voltage (Volt	ts):	9/10/	480	10	10/11/202	-			Phase to Phase V	Voltage (V	/olts):	480	10	10/11/2024
ERY EF - 402			Р	hases (1=Single Phase, 3=Three Phas	se) : _		3						Phases (1=Single Phase, 3	=Three Ph	nase) :	3		
F				30 Day Peak Demand C)n :_	10/7	/2024	=	56.69	_Amps	5		30 Day Pea	k Demand	IOn:	10/7/2024	=	Amps
-				# of Feed	ders_	4			226.76					# of Fe	eders	1		101.00
E	$\left - \right $			Apparent Peak Demand				=	226.76	_KVA			Apparent Peak Deman	d			=	101.00 KVA
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. 				Seasonal adjustment factor					1.00				Seasonal adjustment facto	or			X	1.00
			Seas	onal adjustment peak demand				=	283.45	- KVA			Seasonal adjustment peak de	emand			=	126.25 KVA
			(Occupancy adjustment factor				Х	1.00				Occupancy adjustment fac	tor			Х	1.00
E			Occu	Other adjustment feator(a)				=	283.45	_KVA			Occupancy adjustment peak o	demand			= X	<u>126.25</u> KVA
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·F	$\left - \right $							+		-KVA -K\/A							+	KVA
	┼─┤							·		_```								
TOTAL				Metered Demand Based									Metered Demand Base	d				
			CA	LCULATED DEMAND LOAD :					323.70	_KVA			CALCULATED DEMAND LO	AD:				166.50KVA
OTAL CONNECTED CURRENT (A): 52,536.00									280				CALCULATED DEMAND CUR	RENT ·				200 AMPS
			CAL						203									
TOTAL DEMAND CURRENT (A) 63.19			I	Existing Switchboard Size:				_	2000		s		Existing Switchboard Siz	ze:				AMPS
	1																	

L METERED FOR 30 DAYS AT MDB-1 SEE DEMAND CALC FOR TOTAL LOAD



DATE: 01-08-25 SUBMITTAL: PERMIT/BID SET PROJECT No. 240-317