

ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

PREPARED BY: Jaredian Design Group — Architects, Engineers and Construction Managers

PREPARED FOR: GOVERNMENT OF THE UNITED STATES VIRGIN ISLANDS

WITH: OFFICE OF DISASTER RECOVERY

VIRGIN ISLANDS FIRE AND EMERGENCY MEDICAL SERVICES

PROJECT NO.: 23-005.E

ISSUED FOR: FEMA HMGP REVISION SUBMISSION

ISSUE DATE: 08.27.2025

VICINITY MAP



PROJECT INFORMATION

OWNER:

LOCATION: NO.3C-C-1 ESTATE FORTUNA, WEST END STT

JURISDICTION: ST. THOMAS, U.S. VIRGIN ISLANDS

ARCHITECT: JAREDIAN DESIGN GROUP

APPLICABLE CODES

BUILDING: 2021 INTERNATIONAL BUILDING CODE

FIRE PROTECTION: NFPA

MECHANICAL: 2021 IMC

ELECTRICAL: 2021 IEC

PLUMBING: 2021 IPC

ACCESSIBILITY:

ENERGY: 2021 IEEC

ICC 500 FOR SAFE ROOMS

PROJECT DESCRIPTION

PRIMARY CLASS USE:	MIXED USE
ZONING:	
CONSTRUCTION TYPE:	MASONRY
NO. OF STORIES:	1
BUILDING HEIGHT:	22'-0"
BUILDING AREA:	7,450 SF GROSS AREA 6,993 SF NET AREA
SPRINKLED:	YES
AGE:	NEW

TABLE 803.5 (IBC)
INTERIOR WALL & CEILING FINISH REQUIREMENTS BY OCCUPANCY

GROUP B: NON-SPRINKLED:
VERTICAL EXITS:
EXIT PASSAGEWAYS:
EXIT ACCESS CORRIDORS:
ROOMS & ENCLOSED SPACES:

PROJECT DIRECTORY

ARCHITECT:

JARADIAN DESIGN GROUP

CIVIL/ STRUCTURAL:

BUILDTEC

MEP:

BW&A Atlanta Charlotte Raleigh Established 1987

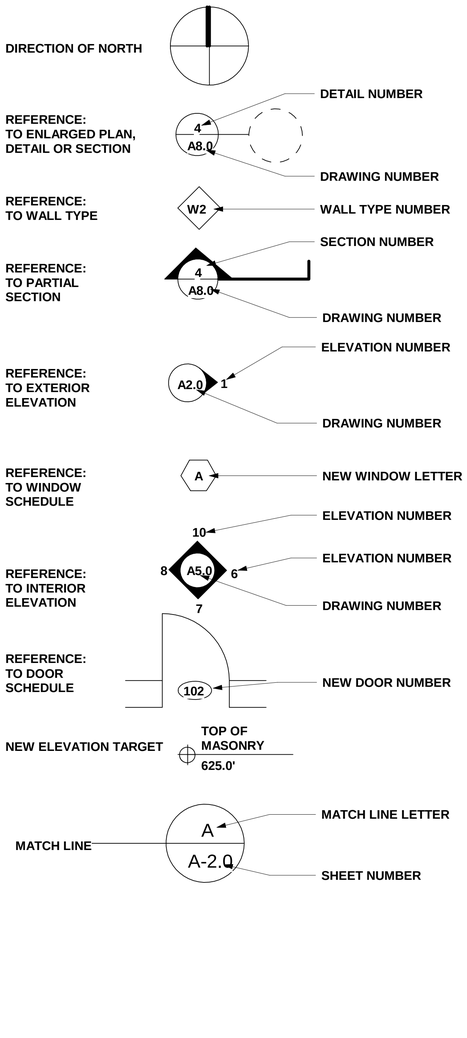
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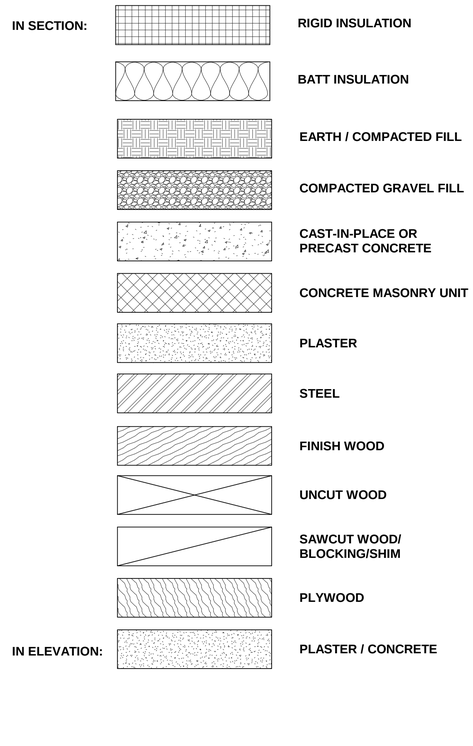
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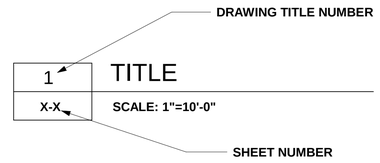
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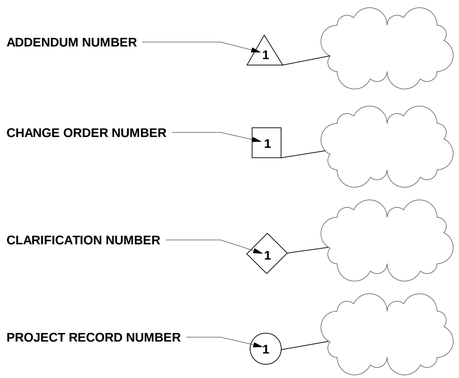
ARCHITECTURAL SYMBOLS:



MATERIALS LEGEND:







ARCHITECTURAL ABBREVIATIONS:

ACT.	ACOUSTIC CEILING TILE
AES.	ARCHITECTURALLY EXPOSED STEEL
A.F.F.	ABOVE FINISH FLOOR
B.T.W.	BOTTOM OF WALL
BLDG.	BUILDING
CONC.	CONCRETE
CMU.	CONCRETE MASONRY UNIT
CWB.	CEMENT WALL BOARD
DIA.	DIAMETER
EA.	EACH
EL.	ELEVATION
ES.	EXPOSED STRUCTURE
EQ.	EQUAL
EXIST.	EXISTING
F.F.	FINISH FLOOR
FIN.	FINISH
FLG.	FLOORING
FTG.	FOOTING
GALV.	GALVANIZED
GWB.	GYPSUM WALL BOARD
GYP.	GYPSUM
HOR.	HORIZONTAL
MTL.	METAL
MO.	MASONRY OPENING
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
PLYW.	PLYWOOD
PNL.	PANEL
PNT.	PAINT
R.W.L.	RAIN WATER LEADER
PTD.	PAINTED
T.O.W.	TOP OF WALL
T.S.	TUBULAR STEEL
U.N.O.	UNLESS NOTED OTHERWISE
VBC.	VINYL BASECOVE
VCT.	VINYL COMPOSITION TILE
WD.	WOOD

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

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ST. THOMAS, U.S. VIRGIN ISLANDS

DATE:	06.20.2024
DRAWN BY:	B.J.S.
CHECKED BY:	J.P.W.
APPROVED BY:	J.P.W.
PROJECT NO.:	23-005.E
CONTRACT NO.:	-
SHEET NO.:	G0.1

GENERAL



GENERAL NOTES

1. THE INTENT OF THIS CONTRACT IS TO PROVIDE FOR THE CONSTRUCTION AND COMPLETION OF THE WORK DESCRIBED IN THE DRAWINGS. THE PRECISE DETAILS OF PERFORMING THE WORK ARE NOT STIPULATED EXCEPT AS CONSIDERED ESSENTIAL FOR THE SUCCESSFUL COMPLETION OF THE WORK. FURNISH ALL LABOR, MATERIAL, EQUIPMENT, TOOLS, TRANSPORTATION, AND SUPPLIES NECESSARY TO COMPLETE THE WORK ACCORDING TO THE CONTRACT.

2. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ALL PROPOSED SOURCES OF MATERIAL BEFORE DELIVERY TO THE PROJECT SITE TO EXPEDITE MATERIAL INSPECTION AND TESTING IF REQUIRED BY THE ARCHITECT. STORED MATERIAL PREVIOUSLY APPROVED FOR PAYMENT MAY AGAIN BE INSPECTED BY THE ARCHITECT FOR COMPLIANCE WITH APPLICABLE CONTRACT SPECIFICATION PRIOR TO BEING INCORPORATED INTO THE WORK.

3. THE CONTRACTOR IS RESPONSIBLE FOR THE SECURITY OF ALL STORED MATERIAL.

4. THE CONTRACTOR SHALL PROVIDE ALL SPACE OUTSIDE THE CONSTRUCTION LIMITS NEEDED FOR STORAGE OF MATERIAL. DO NOT USE PRIVATE PROPERTY FOR STORAGE WITHOUT WRITTEN PERMISSION OF THE OWNER OR LESSEE. FURNISH COPIES OF ALL SUCH AGREEMENTS TO THE ARCHITECT. ANY AREA PROVIDED BY THE OWNER FOR THE STORAGE OF MATERIAL SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT THE END OF THE CONTRACT.

5. THE EXISTING UTILITIES SHOWN ARE FOR INFORMATION ONLY. THERE MAY BE OTHER UTILITIES NOT SHOWN ON THESE PLANS, AND THE ARCHITECT ASSUMES NO RESPONSIBILITY FOR THEIR LOCATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATIONS IN THE FIELD WITHIN THE LIMITS OF THE WORK. ALL DAMAGE MADE TO EXISTING UTILITIES, WHETHER SHOWN OR NOT ON THE PLANS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

6. ALL EXCESS MATERIAL SHALL BE REMOVED FROM THE CONSTRUCTION SITE AND DISPOSED OF BY THE CONTRACTOR AT HIS OWN EXPENSE.

7. WORK THAT DOES NOT CONFORM TO THE CONTRACT, OR TO PREVAILING INDUSTRY STANDARDS WHERE NO SPECIFIC CONTRACT REQUIREMENTS ARE NOTED SHALL BE REMOVED AND REPLACED AT NO COST TO THE OWNER.

8. DO NOT DISTURB AREAS OUTSIDE OF THE LIMITS OF THE AREAS SHOWN ON THE PLANS. DISTURBANCES OUTSIDE THESE LIMITS SHALL BE REPAIRED AND/OR REPLACED AT CONTRACTOR'S EXPENSE.

9. THE CONTRACTOR SHALL PROVIDE DUST CONTROL AND STREET PROTECTION AT ALL TIMES. STREET SHALL NOT BE LEFT IN AN UNSAFE OR MUDDY CONDITION.

10. ALL WORK SHALL BE PERFORMED IN A FINISHED AND WORKMANLIKE MANNER TO THE SATISFACTION OF THE OWNER, AND IN ACCORDANCE WITH THE BEST RECOGNIZED TRADE PRACTICES.

11. THE ARCHITECT SHALL BE NOTIFIED A MINIMUM OF 48 HOURS PRIOR TO STARTUP OF CONSTRUCTION BY THE CONTRACTOR.

12. DEVIATION OF THESE PLANS AND SPECIFICATIONS WITHOUT THE PRIOR WRITTEN CONSENT OF THE ARCHITECT MAY BE CAUSE THE WORK TO BE REJECTED BY THE ARCHITECT.

13. CONTRACTOR WARRANTS THAT HIS EMPLOYEES, AGENTS, AND SUBCONTRACTORS POSSESS THE EXPERIENCE, KNOWLEDGE AND CHARACTER NECESSARY TO QUALIFY THEM INDIVIDUALLY FOR THE PARTICULAR CONSTRUCTION TECHNIQUES THEY PERFORM IN CONNECTION WITH THE TASKS TO BE PERFORMED UNDER THE CONTRACT. THE CONTRACTOR SHALL ENSURE THAT ALL CONSTRUCTION BE IN STRICT COMPLIANCE WITH ALL OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION), AND LOCAL HEALTH AND SAFETY CODES.

14. THE CONTRACTOR SHALL CHECK, REVIEW, AND VERIFY ALL PLANS, DIMENSIONS, AND SITE CONDITIONS PRIOR TO CONSTRUCTION. ANY DISCREPANCIES OR OMISSIONS NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS OR ANY VARIATIONS NEEDED IN ORDER TO CONFORM TO CODE, RULES, AND REGULATIONS SHALL BE REPORTED IN WRITING TO THE ARCHITECT.

15. ALL MATERIALS AND CONSTRUCTION SHALL COMPLY WITH THE LATEST EDITIONS OF THE U.S. VIRGIN ISLANDS BUILDING CODE, THE ACI, AND THE ASTM.

16. THE PREMISES SHALL BE KEPT FROM ACCUMULATION OF WASTE MATERIAL AND DEBRIS, AND AT THE END OF THE JOB THE CONTRACTOR SHALL REMOVE ALL RUBBISH, SURPLUS MATERIAL, AND TOOLS AND LEAVE THE WORK AREA BROOM CLEAN.

17. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE AND THE VIRGIN ISLANDS CODE.

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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Architects, Engineers and Construction Managers

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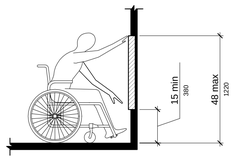
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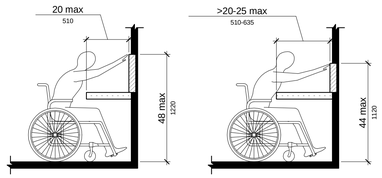
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GENERAL AND DEMOLITION NOTES

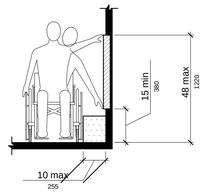
REGISTERED ARCHITECT
U.S. VIRGIN ISLANDS



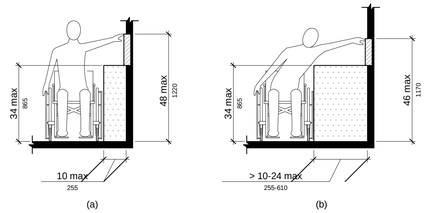
UNOBSTRUCTED FORWARD REACH



OBSTRUCTED HIGH FORWARD REACH



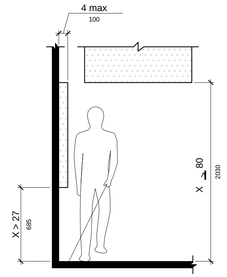
UNOBSTRUCTED FORWARD REACH



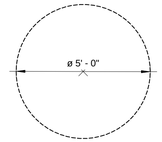
OBSTRUCTED HIGH FORWARD REACH

1 BUILDING BLOCKS

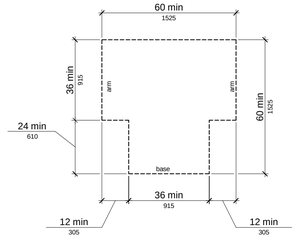
3/8" = 1'-0"



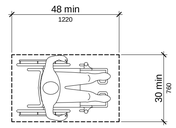
LIMIT OF PROTRUDING OBJECTS



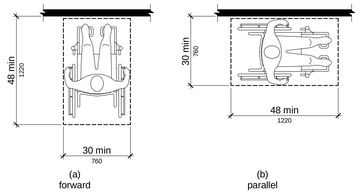
CIRCULAR TURNING SPACE



T-SHAPED TURNING SPACE



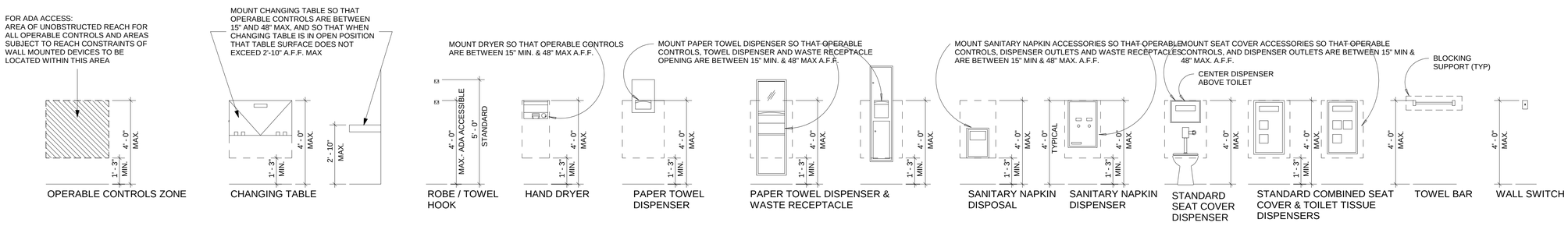
CLEAR FLOOR OR GROUND SPACE



POSITION OF CLEAR FLOOR OR GROUND SPACE

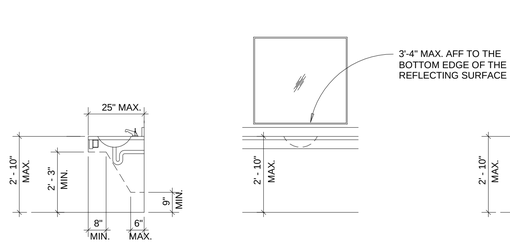
2 FLOOR CLEARANCES

3/8" = 1'-0"



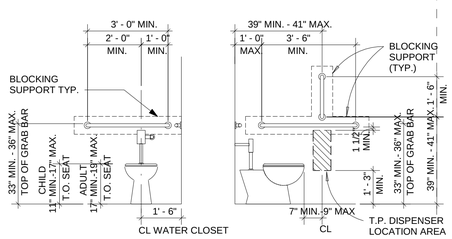
3 MOUNTING HEIGHTS

3/8" = 1'-0"



4 ADA SINK & VANITY

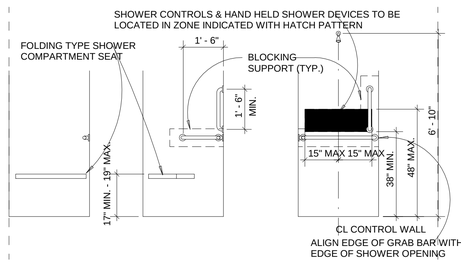
3/8" = 1'-0"



ADA TOILET & GRAB BARS - FLOOR MTD.

5 ADA TOILET & GRAB BAR

3/8" = 1'-0"



SHOWER / ADA SHOWER

6 SHOWER/ ADA SHOWER

3/8" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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TYPICAL DETAILS

REGISTERED ARCHITECT U.S. VIRGIN ISLANDS

DIVISION I- GENERAL REQUIREMENTS AND COVENANTS

1. ONLY APPROVED MATERIALS SHALL BE USED
CONTRACTOR SHALL USE ONLY MATERIALS IN THE WORKS THAT MEET THE REQUIREMENTS OF THESE SPECIFICATIONS, RELEVANT SECTIONS OF FLORIDA DEPARTMENT OF TRANSPORTATION PUBLICATION "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION 2000."

2. INSPECTION AND TESTS AT SOURCE OF SUPPLY
2.1 GENERAL: IF THE VOLUME, PROGRESS OF THE WORK, AND OTHER CONSIDERATIONS WARRANT, THE ENGINEER OF RECORD(E.O.R.) MAY INSPECT THE MATERIALS AT THE SOURCE OF SUPPLY.
2.2 COOPERATION BY CONTRACTOR: THE CONTRACTOR SHALL PROVIDE THE E.O.R. WITH FREE ENTRY AT ALL TIMES TO SUCH PARTS OF THE PLANT THAT CONCERN THE MANUFACTURE OR PRODUCTION OF THE MATERIALS ORDERED.

3. CONTROL BY SAMPLES AND TESTS
3.1 PAVEMENT SAMPLES: FOR BOTH BASE COURSE AND SURFACE COURSE PAVEMENTS, THE CONTRACTOR SHALL FURNISH SAMPLES TAKEN FROM THE COMPLETED WORK FROM ANY LOCATION THAT THE E.O.R. INDICATES, AND IMMEDIATELY REPLACE THE AREAS SO REMOVED WITH MATERIALS AND CONSTRUCTION THAT MEET THE REQUIREMENTS OF THESE SPECIFICATIONS AND TO THE LINE AND GRADE OF THE IMMEDIATE SURROUNDING PAVEMENT SURFACE.
3.2 APPLICABLE STANDARDS: METHODS OF SAMPLING AND TESTING MATERIALS SHALL BE IN ACCORDANCE WITH STANDARDS OF AASHTO OR ASTM.
3.3 SIEVES: USE SIEVES MEETING THE REQUIREMENTS OF AASHTO M 92.
3.4 INSPECTION AT PLANTS: CONTRACTOR SHALL PROVIDE THE ENGINEER WITH ACCESS TO ALL PARTS OF ALL PAVING OR OTHER PLANTS CONNECTED WITH THE WORK TO OBSERVE WEIGHTS OR PROPORTIONS OR CHARACTER OF MATERIALS AND TO DETERMINE TEMPERATURE USED IN PREPARING MATERIALS AND MIXTURES.
3.5 COMPACTION TESTS - PAVEMENT MATERIALS
3.5.1 WHEN REQUESTED BY THE ENGINEER OF RECORD (E.O.R.): NUCLEAR DENSITY OR OTHER APPROVED COMPACTION TESTS SHALL BE CARRIED OUT ON EACH LAYER OF COMPACTED BASE AND EMBANKMENTS. TWENTY-FOUR HOURS NOTICE OF ANY TEST SHALL BE GIVEN TO THE PROJECT ENGINEER AND COPIES OF THE TEST RESULT SHALL BE FORWARDED TO THE E.O.R. AS SOON AS POSSIBLE. THE CONTRACTOR SHALL KEEP COPIES OF THE TIME AND LOCATION OF ALL TESTS.
3.5.2 FIELD-TESTING: SHALL CONFORM TO ASTM STANDARDS OR APPROVED EQUIVALENT. MOISTURE DENSITY CURVES SHALL CONFORM TO ASTM D698-78; SIEVE ANALYSES TO ASTM C136-84A; AND FIELD DENSITIES TO ASTM D2167-84 OR TO ASTM D2922-81.

4. STORAGE OF MATERIALS
4.1 METHOD OF STORAGE: MATERIALS SHALL BE STORED IN SUCH A MANNER AS TO PRESERVE THEIR QUALITY AND FITNESS FOR THE WORK TO FACILITATE PROMPT INSPECTION AND TO MINIMIZE THE NOISE IMPACTS ON SENSITIVE RECEIVERS.

5. DEFECTIVE MATERIALS
5.1 THE FOLLOWING MATERIALS SHALL BE CONSIDERED DEFECTIVE: ALL MATERIALS NOT MEETING THE REQUIREMENTS OF THESE SPECIFICATIONS; MATERIALS THAT ARE OR HAVE BEEN IMPROPERLY STORED; AND MATERIALS THAT ARE MIXED WITH EXCESS OF CLAY, COAL , STICKS, BURLAP, HAY, STRAW, LOAM OR EARTH, OR OTHER DEBRIS.

6. LEGAL REQUIREMENTS AND RESPONSIBNLITY TO THE PUBLIC
6.1 OCCUPATIONAL SAFETY AND HEALTH REQUIREMENTS: THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY FOR THE PROTECTION OF LIFE, HEALTH AND GENERAL OCCUPATIONAL WELFARE OF ALL PERSONS INCLUDING THE CONTRACTORS EMPLOYEES AND AUTHORIZED VISITORS TO THE SITE.

7. SANITARY PROVISIONS
7.1 THE CONTRACTOR SHALL PROVIDE AND MAINTAIN, IN A NEAT AND SANITARY CONDITION, SUCH ACCOMMODATIONS FOR THE USE OF HIS EMPLOYEES AS ARE NECESSARY TO COMPLY WITH THE REQUIREMENTS AND REGULATIONS OF THE UNITED STATES VIRGIN ISLANDS (USVI),

8. CONTROL OF CONTRACTOR'S EQUIPMENT
8.1 PROTECTION FROM DAMAGE BY TRACTOR-TYPE EQUIPMENT: THE CONTRACTOR SHALL TAKE POSITIVE MEASURES TO ENSURE THAT TRACTOR-TYPE EQUIPMENT DOES NOT DAMAGE THE ROAD. IF SUCH DAMAGE SHOULD OCCUR, CONTRACTOR SHALL REPAIR IT WITHOUT DELAY, AT NO EXPENSE TO THE OWNER AND SUBJECT TO THE APPROVAL OF THE E.O.R.

9. PRESERVATION OF PROPERTY
9.1 UTILITIES: CONTRACTOR SHALL NOT COMMENCE WORK AT POINTS WHERE THE CONSTRUCTION OPERATIONS ARE ADJACENT TO UTILITY FACILITIES OR OTHER PROPERTY, UNTIL MAKING ARRANGEMENTS WITH THE UTILITY FACILITIES TO PROTECT AGAINST DAMAGE THAT MIGHT RESULT IN EXPENSE, LOSS, DISRUPTION IN SERVICE OR OTHER INCONVENIENCE TO THE PUBLIC OR THE OWNERS.

10. RECORD OF CONSTRUCTION MATERIALS

10.1 GENERAL: FOR ALL CONSTRUCTION MATERIALS USED IN CONSTRUCTION OF THE PROJECT, THE CONTRACTOR SHALL PRESERVE FOR THE E.O.R'S INSPECTION THE INVOICES AND RECORDS OF MATERIALS FOR A PERIOD OF THREE YEARS FROM THE DATE OF COMPLETION OF THE PROJECT. THIS ALSO APPLIES TO MATERIALS PURCHASED BY SUBCONTRACTORS.

DIVISION II- CONSTRUCTION DETAILS

1. CONSTRUCTION EQUIPMENT-GENERAL REQUIREMENTS
1.0 GENERAL: UNLESS RESTRICTED TO A SPECIFIC TYPE BY THE CONTRACT DOCUMENTS OR THE E.O.R., THE CONTRACTOR MAY PERFORM THE WORK USING EQUIPMENT, TOOLS, MACHINERY, ETC., OF HIS OWN CHOOSING. NOTE THAT FACILITIES TO BE CONSTRUCTED UNDER THE CONTRACT ARE ADEQUATE TO SUPPORT ONLY THEIR DESIGN LOADS IN THEIR COMPLETED CONSTRUCTION STAGE. IF THE CONTRACTOR'S EQUIPMENT OR PROCEDURES DURING CONSTRUCTION DAMAGE ANY PART OF THE FACILITY, THE CONTRACTOR SHALL REPLACE OR REPAIR IT AS DIRECTED BY THE E.O.R . AT NO EXPENSE TO THE OWNER.

2. MAINTENANCE OF TRAFFIC
2.1 DESCRIPTION: THE CONTRACTOR SHALL MAINTAIN TRAFFIC WITHIN THE LIMITS OF THE PROJECT FOR THE DURATION OF THE CONSTRUCTION PERIOD, INCLUDING ANY TEMPORARY SUSPENSIONS OF THE WORK. CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ANY DETOUR FACILITIES, PROVIDE NECESSARY FACILITIES FOR ACCESS TO RESIDENCES, BUSINESSES, ETC., ALONG THE PROJECT. CONTRACTOR SHALL FURNISH AND APPLY CALCIUM CHLORIDE OR WATER ON THE SUBGRADE, UNSURFACD BASE, OR OTHER UNSURFACED TRAVELED WAYS IN ORDER TO CONTROL DUST DURING THE CONSTRUCTION OPERATIONS.

3. TRAFFIC CONTROL
3.1 STANDARDS: FHWA'S MUTCD PART VI IS THE MINIMUM STANDARDS FOR TRAFFIC CONTROL FOR HIGHWAY CONSTRUCTION, MAINTENANCE AND UTILITY OPERATIONS. CONTRACTOR SHALL UNDERSTAND THE STANDARDS ESTABLISHED IN THE AFOREMENTIONED MANUAL CONSTITUTE THE MINIMUM REQUIREMENTS FOR NORMAL CONDITIONS. THE E.O.R. MAY REQUIRE ADDITIONAL TRAFFIC CONTROL DEVICES, WARNING DEVICES, BARRIERS, OR OTHER SAFETY DEVICES WHERE UNUSUAL, COMPLEX, OR PARTICULARLY HAZARDOUS CONDITIONS EXIST.
3.2 MAINTENANCE OF DEVICES AND BARRIERS-P CONTRACTOR SHALL KEEP TRAFFIC CONTROL DEVICES, WARNING DEVICES, AND BARRIERS IN THE CORRECT POSITION PROPERLY DIRECTED, CLEARLY VISIBLE AND CLEAN AT ALL TIMES. CONTRACTOR SHALL IMMEDIATELY REPAIR, REPLACE OR CLEAN DAMAGED, DEFACED, OR DIRTY DEVICES OR BARRIERS AND HAVE THE E.O.R. APPROVE THEM FOR USE.

4. PREVENTION, CONTROL AND ABATEMENT OF EROSION AND WATER POLLUTION
4.1 DESCRIPTION: CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES ON THE PROJECT AND IN AREAS OUTSIDE THE RIGHT-OF-WAY WHERE WORK IS ACCOMPLISHED IN CONJUNCTION WITH THE PROJECT, SO AS TO PREVENT POLLUTION OF WATER, DETRIMENTAL EFFECTS TO PUBLIC OR PRIVATE PROPERTY ADJACENT TO THE PROJECT RIGHT-OF-WAY AND DAMAGE TO WORK ON THE PROJECT. CONTRACTOR SHALL CONSTRUCT AND MAINTAIN TEMPORARY EROSION CONTROL FEEATURES OR, WHERE PRACTICAL, CONSTRUCT AND MAINTAIN PERMANENT EROSION CONTROL FEATURES AS SHOWN IN THE PLANS OR AS MAY BE DIRECTED BY THE E.O.R.

5. CLEARING AND GRUBBING
5.1 DESCRIPTION: CONTRACTOR SHALL CLEAR AND GRUB WITHIN THE AREAS OF THE ROADWAY RIGHT-OF-WAY AND OF BORROW PITS, SAND-CLAY BASE MATERIAL PITS, LATERAL DITCHES AND ANY OTHER AREAS SHOWN IN THE PLANS TO BE CLEARED AND GRUBBED. REMOVE AND DISPOSE OF ALL TREES, STUMPS, ROOTS, AND OTHER SUCH PROTRUDING OBJECTS, AND BUILDINGS, STRUCTURES, APPURTENANCES, EXISTING FLEXIBLE ASPHALT PAVEMENT, AND OTHER FACILITIES NECESSARY TO PREPARE THE AREA FOR THE PROPOSED CONSTRUCTION, AND REMOVE AND DISPOSE OF ALL PRODUCT AND DEBRIS NOT REQUIRED TO BE SALVAGED OR NOT REQUIRED TO COMPLETE THE CONSTRUCTION.
CONTRACTOR SHALL ALSO PERFORM MISCELLANEOUS WORK THE E.O.R. CONSIDERS NECESSARY FOR THE COMPLETE PREPARATION OF THE OVERALL PROJECT SITE AS FOLLOWS:
(a) PLUG ANY WATER WELLS THAT ARE ENCOUNTERED WITHIN THE RIGHT-OF-WAY AND THAT ARE TO BE ABANDONED,
(b) LEVEL THE TERRAIN OUTSIDE THE LIMITS OF CONSTRUCTION FOR PURPOSES OF FACILITATING MAINTENANCE AND OTHER POST-CONSTRUCTION OPERATIONS.
(c) TRIM TREES AND SHRUBS WITHIN THE PROJECT RIGHT-OF-WAY THAT ARE IDENTIFIED IN THE PROJECT DOCUMENTS.

6. STABILIZING
6.1 DESCRIPTION: STABILIZE DESIGNATED PORTIONS OF THE ROADBED TO PROVIDE A FIRM AND UNYIELDING SUBGRADE, HAVING THE REQUIRED BEARING VALUE SPECIFIED IN THE PLANS. WHEN SPECIFIED IN THE PLANS, PROVIDE ADDITIONAL STRENGTHENING OF THE SUBBASE BY ADDITIONAL STABILIZING OF THE UPPER PORTION OF THE PREVIOUSLY STABILIZED SUBGRADE, WITHIN THE LIMITS SPECIFIED.
6.2 MAXIMUM PARTICLE SIZE OF MIXED MATERIALS: AT THE COMPLETION OF THE MIXING, ENSURE THAT THE GRADATION OF THE MATERIAL WITHIN THE LIMITS OF THE AREA BEING STABILIZED IS SUCH THAT 97% WILL PASS A 3 1/2" (90MM) SIEVE AND THAT THE MATERIAL DOES NOT HAVE A PLASTICITY INDEX GREATER THAN EIGHT OR LIQUID LIMIT GREATER THAN THIRTY.

6.3 DENSITY REQUIREMENTS: WITHIN THE ENTIRE LIMITS OF THE WIDTH AND DEPTH OF THE AREAS TO BE STABILIZED, OBTAIN A MAXIMUM DENSITY OF 98% OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO T180.

7. GRANULAR BASE
7.1 MATERIALS: MATERIALS SHALL MEET THE REQUIREMENTS OF THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) STANDARD. THE CONTRACTOR MAY USE MORE THAN ONE SOURCE OF GRANULAR BASE ON A SINGLE CONTRACT PROVIDED THAT A SINGLE SOURCE IS USED THROUGHOUT THE ENTIRE WIDTH AND DEPTH OF A SECTION OF BASE. OBTAIN APPROVAL FROM THE E.O.R. BEFORE PLACING MATERIAL FROM MORE THAN ONE SOURCE.
7.2 METHOD OF SPREADING: CONTRACTOR SHALL SPREAD THE ROCK UNIFORMLY, REMOVE ALL SEGREGATED AREAS OF FINE OR COURSE ROCK AND REPLACE THEM WITH PROPERLY GRADED ROCK.
7.3 GRANULAR BASE FOR SHOULDER PAVEMENT: UNLESS OTHERWISE PERMITTED, CONTRACTOR SHALL COMPLETE ALL GRANULAR BASE SHOULDER CONSTRUCTION AT ANY PARTICULAR LOCATION BEFORE PLACING THE FINAL COURSE OF PAVEMENT ON THE TRAVELED ROADWAY. WHEN DUMPING MATERIAL FOR THE CONSTRUCTION OF A GRANULAR BASE ON THE SHOULDERS, DO NOT ALLOW MATERIAL CAPABLE OF SCARRING OR CONTAMINATING THE PAVEMENT SURFACE ON THE ADJACENT PAVEMENT. IMMEDIATELY SWEEP OFF ANY GRANULAR MATERIAL THAT IS DEPOSITED ON THE SURFACE COURSE.
7.4 DENSITY REQUIREMENTS: WHEN PROPER MOISTURE CONDITIONS ARE OBTAINED, COMPACT MATERIAL TO NOT LESS THAN 98% OF MAXIMUM DENSITY DETERMINED BY AASHTO T180. COMPACT THE GRANULAR BASE FOR SHOULDER PAVEMENT TO NOT LESS THAN 95% OF MAXIMUM DENSITY DETERMINED BY AASHTO T180.
7.5 PRIMING: CONTRACTOR SHALL APPLY THE PRIME COAT ONLY WHEN THE BASE MEETS THE SPECIFIED DENSITY REQUIREMENTS AND WHEN THE MOISTURE CONTENT IN THE TOP HALF OF THE BASE DOES NOT EXCEED 90% OF THE OPTIMUM MOISTURE OF THE BASE MATERIAL. AT THE TIME OF PRIMING ENSURE THAT THE BASE IS FIRM, UNYIELDING AND IN SUCH CONDITION THAT NO UNDUE DISTORTION WILL OCCUR.
7.6 MAINTAINING: MAINTAIN THE TRUE CROWN AND TEMPLATE, WITH NO RUTTING OR OTHER DISTORTION WHEN APPLYING THE SURFACE COURSE.

8. PRIME AND TACK COATS FOR BASE COURSES
8.1 DESCRIPTION: CONTRACTOR SHALL APPLY PRIME COATS ON PREVIOUSLY PREPARED BASES, AND APPLY TACK COATS ON PREVIOUSLY PREPARED BASES AND ON EXISTING PAVEMENT SURFACES.
8.2 PRIME COAT: FOR PRIME COAT, CONTRACTOR SHALL USE CUTBACK ASPHALT GRADE RC-70 OR RC-250) MEETING REQUIREMENTS OF FDOT STANDARD SPECIFICATIONS, SECTION 916-3.
8.3 COVER MATERIAL FOR PRIME COAT: UNIFORMLY COVER THE PRIME BASE BY A LIGHT APPLICATION OF COVER MATERIAL. THE CONTRACTOR MAY USE EITHER SAND OR SCREENINGS FOR COVER MATERIAL. FOR THE SAND, MEET THE REQUIREMENTS OF FDOT STANDARD SPECIFICATIONS SECTION 902-2 OR 902-6. AND FOR THE SCREENINGS MEET THE REQUIREMENTS OF FDOT STANDARD SPECIFICATIONS SECTION 902-5. IF EXPOSING THE PRIMED BASE COURSE TO GENERAL TRAFFIC, APPLY A COVER MATERIAL THAT HAS BEEN COATED WITH 2 TO 4% ASPHALT CEMENT. APPLY THE ASPHALT COATED MATERIAL AT APPROXIMATELY 10 LB /SQ.YD [5.5 KG/SQ. M]. ROLL THE ENTIRE SURFACE OF ASPHALT COATED MATERIAL WITH A TRAFFIC ROLLER AS REQUIRED TO PRODUCE A REASONABLE DENSE MAT.
8.4 TACK COAT: UNLESS THE CONTRACT DOCUMENTS CALL FOR A SPECIFIC TYPE OR GRADE OF TACK COAT, USE UNDILUTED EMULSIFIED ASPHALT GRADES RS-1 OR RS-2 MEETING THE REQUIREMENTS OF FDOT STANDARD SPECIFICATIONS SECTION 916-4. HEAT RS-1 OR RS-2 TO A TEMPERATURE OF 140 TO 180° F [60 TO 82°C].
8.5 APPLICATION OF PRIME COAT
8.5.1 GENERAL: CONTRACTOR SHALL CLEAN THE SURFACE TO BE PRIMED AND ENSURE THAT THE MOISTURE CONTENT OF THE BASE DOES NOT EXCEED 90% OF THE OPTIMUM MOISTURE. ENSURE THAT THE TEMPERATURE OF THE PRIME MATERIAL IS BETWEEN 100 AND 150° F (40 AND 65° C). APPLY THE MATERIAL WITH A PRESSURE DISTRIBUTOR. DETERMINE THE APPLICATION AMOUNT BASED ON THE CHARACTER OF THE SURFACE. USE AN AMOUNT SUFFICIENT TO COAT THE SURFACE THOROUGHLY AND UNIFORMLY WITH NO EXCESS.
8.5.2 RATE OF APPLICATION: CONTRACTOR SHALL USE A RATE OF APPLICATION THAT IS NOT LESS THAN 0.1 GAL/SQ.YD [0.5 L/SQ.M], UNLESS A LOWER RATE IS DIRECTED BY THE E.O.R.
8.6 APPLICATION OF PRIME COAT
8.6.1 WHERE REQUIRED: IN GENERAL THE E.O.R. WILL NOT REQUIRE A TACK COAT ON PRIMED BASES EXCEPT IN AREAS THAT HAVE BECOME EXCESSIVELY DIRTY AND CANNOT BE CLEANED, OR IN AREAS WHERE THE PRIME HAS CURED TO AN EXTENT THAT IT HAS LOST ALL BONDING EFFECT. GENERALLY, THE E.O.R. WILL REQUIRE A TACK COAT ON HOT BITUMINOUS BASE COURSE BEFORE PLACING THE SURFACE COURSE.
8.6.2 METHOD OF APPLICATION: CONTRACTOR SHALL APPLY THE TACK COAT WITH A PRESSURE DISTRIBUTOR EXCEPT THAT ON SMALL JOBS, IF APPROVED BY THE E.O.R., IT MAY BE APPPLIED BY OTHER MECHANICAL DEVICES OR BY HAND METHODS. HEAT THE BITUMINOIS MATERIAL TO A SUITABLE TEMPERATURE AS DESIGNATED BY THE E.O.R., AND APPLY IT IN A THIN, UNIFORM LAYER.
8.6.3 RATE OF APPLICATION: CONTRACTOR SHALL USE A RATE OF APPLICATION BETWEEN 0.02 AND 0.08 GAL/SQ.YD [0.09 AND 0.36 L/SQ.M].

9. BITUMINOUS SURFACE TREATMENT (INCLUDING MINERAL SEAL COAT)
9.1 DESCRIPTION: CONTRACTOR SHALL CONSTRUCT A WEARING SURFACE OF SEPARATE APPLICATIONS OF BITUMINOUS MATERIAL COVEREED WITH AGGREGATE, EITHER IN SINGLE APPLICATIONS, DOUBLE (ALTERNATE) APPLICATIONS OR TRIPLE (ALTERNATE) APPLICATIONS
9.2 COMPOSITION AND PROPORTIONING: THE COMPOSITION AND PROPORTIONING FOR THE VARIOUS TYPES OF BITUMINOUS SURFACE TREATMENT AND FOR MINERAL SEAL COAT SHALL BE AS PER THE TABLES IN FDOT STANDARD SPECIFICATIONS SECTION 310-2.

9.3 EQUIPMENT:
9.3.1 PRESSURE DISTRIBUTOR: CONTRACTOR SHALL PROVIDE A PRESSURE DISTRIBUTOR THAT IS EQUIPPED WITH PNEUMATIC TIRES HAVING A SUFFICIENT WIDTH OF RUBBER IN CONTACT WITH THE ROAD SURFACE TO AVOID BREAKING THE BOND OR FORMING A RUT IN THE SURFACE. ENSURE THAT THE DISTANCES BETTWEEN THE CENTRES OF OPENINGS OF THE OUTSIDE NOZZLES OF THE SPRAY BAR IS EQUAL TO THE WIDTH OF THE APPLICATION REQUIRED, WITHIN A ALLOWABLE VARIATION OF 2 INCHES [50 MM]. ENSURE THAT THE OUTSIDE NOZZLE AT EACH END OF THE SPRAY BAR HAS AN AREA OF OPENING NOT LESS THAN 25% OR MORE THAN 75% IN EXCESS OF THE OTHER NOZZLES. ENSURE THAT ALL NOZZLES HAVE UNIFORM OPENINGS.
9.3.2 SPREADING EQUIPMENT: CONTRACTOR SHALL PROVIDE SUFFICIENT TRUCKS AD AGGREGATE SPREADERS AT THE SITE OF THE WORK TO ENSURE CONTINUOUS SPREADING OF THE AGGREGATE ON THE UNCOVERED BITUMINOUS MATERIAL. USE A SPREADER OF THE MECHANICAL TYPE THAT IS SELF-SUPPORTED (TOWED) OR SELF-PROPELLED THAT IS CAPABLE OF PRODUCING A SMOOTH, UNIFORM DISTRIBUTION OF THE COVER MATERIAL. DO NOT USE SPREADERS OF THE TYPE ATTACHED DIRECTLY TO THE BACK OF THE TRUCK BODY (TAIL GATE SPREADERS).
9.3.3 ROLLERS: CONTRACTOR SHALL PROVIDE ROLLERS THAT ARE 3 TO 5 TON [2.7 TO 4.5 METRIC TON] STEEL-TIRED OR COMBINATION STEEL AND RUBBER-TIRED. ROLLERS AND SELF-PROPELLED. PNEUMATIC-TIRED TRAFFIC TYPE ROLLERS THAT ARE EQUIPPED WITH AT LEAST SEVEN SMOOTH-TREAD, LOW-PRESSURE TIRES AND CAPABLE OF CARRYING A LOAD OF AT LEAST 8 TONS [7 METRIC TONS]. MAINTAIN THE INFLATION IN THE TIRES SUCH THAT IN NO TWO TIRES THE AIR PRESSURE VARIES MORE THAN 5 PSI [35 KPA]. LOAD THE TRAFFIC LOADER AS DIRECTED BY THE E.O.R.
9.4 APPLICATION OF BITUMINOUS MATERIAL:
9.4.1 DISTRIBUTOR PRESSURE: AFTER CLEANING THE SURFACE TO BE TREATED TO THE SATISFACTION OF THE E.O.R., THE CONTRACTOR SHALL UNIFORMLY SPRAY THE BITUMINOUS MATERIAL OVER THE SURFACE BY MEANS OF A PRESSURE DISTRIBUTOR, WHEN A SURFACE CONSTRUCTED UNDER THIS SECTION IS ON A PAVED SHOULDER, USE A STRINGLINE OR OTHER APPROVED METHOD TO PRODUCE A UNIFORM LINE ALONG THE EDGE OF THE APPLIED BITUMINOUS MATERIAL ADJACENT TO THE TRAFFIC LANES. USE A DISTRIBUTOR THAT MAINTAINS A PRESSURE OF AT LEAST 20 PSI [140 KPA] AND 75 PSI [520 KPA].
9.4.2 APPLICATION TEMPERATURES: FOR ASPHALT CEMENT, MAINTAIN AN APPLICATION TEMPERATURE BETWEEN 300 AND 350° F [150 AND 175° C]. FOR EMULSIFIED ASPHALT MAINTAIN AN APPLICATION TEMPERATURE BETWEEN 100 AND 170° F [38 AND 75° C]. FOR CUT-BACK ASPHALT, MAINTAIN AN APPLICATION TEMPERATURE BETWEEN 175 AND 275° F [80 AND 135° C].
9.4.3 UNIFORMITY OF DISTRIBUTION: CONTRACTOR SHALL TAKE SPECIAL PRECAUTIONS TO OBTAIN AN EVEN AND UNIFORM DISTRIBUTIOIN OF BITUMINOUS MATERIAL, AND ADJUST AND OPERATE THE DISTRIBUTOR SO AS TO MAINTAIN UNIFORM, EVEN DISTRIBUTION OF THE MATERIAL BEING APPLIED. IMMEDIATELY REMOVE EXCESSIVE DEPOSITS OF BITUMINOUS MATERIAL UPON THE ROAD SURFACE CAUSED BY STOPPING AND STARTING THE DISTRIBUTOR, BY LEAKAGE OR OTHERWISE.
9.5 SPREADING COVER MATERIAL
9.5.1 SPREADING: SPREAD THE COVER MATERIAL IMMEDIATELY FOLLOWING EACH APPLICATION OF BITUMINOUS MATERIAL. UNIFORMLY DISTRIBUTE THE COVER MATERIAL OVER THE BITUMINOUS SURFACE IN ONE, TWO, OR THREE COURSES AS SPECIFIED. PERFORM SPREADING USING APPROVED MECHANICAL SPREADERS, USING ONLY DIRVERS EXPERIENCED IN THIS TYPE OF WORK FOR DRIVING THE SPREADERS. DO NOT DRIVE TRUCKS OR SPREADERS ON THE UNCOVERED BITUMINOUS MATERIAL.
9.5.2 BROOMING AND DRESSING: IMMEDIATELY AFTER EACH APPLICATION OF COVER MATERIAL, BROOM THE SURFACE IN ORDER TO SECURE A UNIFORM DISTRIBUTION OF COVER MATERIAL AND A SMOOTH SURFACE. PLACE ADDITIONAL AGGREGATE BY HAND ON ANY AREAS NOT PROPERLY COVERED.
9.6 ROLLING AND CURING
9.6.1 GENERAL REQUIREMENTS: IMMEDIATELY AFTER THE SPREADING AND DRAGGING OF EACH APPLICATION OF COVER MATERIAL, ROLL THE ENTIRE SURFACE. BEGIN ROILLING WITHIN 30 MINUTES AFTER SPREADING OF THE COVER MATERIAL. BEGIN ROLLING AT THE EDGES AND PROGRESS TO THE CENTRE OF THE SURFACE. UNIFORMLY LAPPING EACH PRECEDING PASS AND THOROUGHLY COVERING THE ENTIRE SURFACE. DURING ROLLING, PERFORM ADDITIONAL DRAGGING AND HANDBROOMING AS SPECIFIED ABOVE. FIRST ROLL THE ENTIRE SURFACE WITH A TRAFFIC ROLLER, FOLLOWED IMMEDIATELY WITH A STEEL-WHEELED ROLLER. COVER THE ENTIRE SURFACE WITH A STEEL-WHEELED ROLLER. THEN, ROLL THE COVER MATERIAL AGAIN WITH THE TRAFFIC ROLLER, CONTINUE THE ROLLING AS LONG AS IS NECESSARY TO ENSURE THE THOROUGH KEYING OF THE COVER MATERIAL AND TO SECURE A UNIFORMLY CLOSED SURFACE.
9.6.2 SHOULDER PAVEMENT: FOR BITUMINOUS SURFACE-TREATED SHOULDER PAVEMENT, THE E.O.R. MAY REQUIRE ADDITIONAL ROLLING AS HE DEEMS NECESSARY TO COMPENSATE FOR THE LACK OF SUBSEQUENT ROLLING BY HIGHWAY TRAFFIC.
9.7 SURFACE REQUIREMENTS: CONTRACTOR SHALL PROVIDE A FINISHED SURFACE THAT IS UNIFORM AND CONFORMS TO THE LINES, GRADES AND CROSS SECTIONS SHOWN IN THE PLANS. REMOVE ALL PORTIONS OF THE COMPLETED SURFACE THAT ARE DEFECTIVE, ARE NOT PROPERLY FINISHED, HAVE FAT JOINTS, OR ARE NOT IN REASONABLY CLOSE CONFORMANCE WITH THESE SPECIFICATIONS, AND REPLACE THEM WITH A SATISFACTORY SURFACE.
9.8 PROTECTION: AFTER APPLYING THE BITUMINOUS MATERIAL, THE CONTRACTOR SHALL PREVENT TRAFFIC FROM USING THE ROAD UNTIL PLACING AND THOROUGHLY ROLLING THE COVER MATERIAL. IF POSSIBLE COMPLETE THE TRAFFIC OFF THE FINISHED SURFACE FOR AT LEAST 48 HOURS AFTER COMPLETING FINISHING

10. HOT BITUMINOUS MIXTURES
10.1 TRANSPORTATION OF THE MIXTURE: TRANSPORT THE MIXTURE IN TIGHT VEHICLES PREVIOUSLY CLEANED OF ALL FOREIGN MATERIAL. AFTER CLEANING, THINLY COAT THE INSIDE OF THE TRUCK BODIES WITH SOAPY WATER OR AN APPROVED EMULSION CONTAINING NOT MORE THAN 5% OIL. APPLY THE COATING PRIOR TO THE FIRST LOADING EACH DAY AND REPEAT AS NECESSARY THROUGHOUT THE DAY'S OPERATIONS. AFTER THE TRUCK BODIES ARE COATED AND BEFORE ANY MIXTURE IS PLACED THEREIN, RAISE THEM TO DRAIN OUT ANY EXCESS LIQUIDS. COVER EACH LOAD DURING COOL AND CLOUDY WEATHER AND AT ANY TIME THERE IS A PROBABILITY OF RAIN.
10.2 PREPARATION OF APPLICATION SURFACES
10.2.1 CLEANING: PRIOR TO THE LAYING OF THE MIXTURE, CLEAN THE SURFACE OF THE BASE OR THE PAVEMENT TO BE COVERED OF ALL LOOSE OR DELETERIOUS MATERIAL BY THE USE OF POWER BROOMS OR BLOWERS, SUPPPLEMENTED BY HAND BROOMING WHERE NECESSARY.
10.2.2 PATCHING AND LEVELING COURSES: WHEN AN ASPHALT MIX IS TO BE PLACED ON AN EXISTING PAVEMENT OR OLD BASE WHICH IS IRREGULAR, AND WHEREVER THE PLANS INDICATE, BRING THE EXISTING SURFACE TO PROPER GRADE AND CROSS SECTION BY THE APPLICATION OF PATCHING AND LEVELING COURSES.
10.2.3 APPLICATION OVER SURFACE TREATMENT: WHERE AN ASPHALT MIX IS TO BE PLACED OVER NEWLY CONSTRUCTED SURFACE TREATMENT, SWEEP AND DISPOSE OF ALL LOOSE MATERIAL FROM THE PAVING AREA.
10.2.4 COATING SURFACES OF CONTACTING STRUCTURES: PAINT ALL STRUCTURES WHICH WILL BE IN ACTUAL CONTACT WITH THE ASPHALT MIXTURE, WITH THE EXCEPTION OF THE VERTICAL FACES OF THE EXISTING PAVEMENTS AND CURBS OR CURB AND GUTTER, WITH A UNIFORM COATING OF ASPHALT CEMENT TO PROVIDE A CLOSELY BONDED, WATER-TIGHT JOINT.
10.3 PLACING MIXTURE
10.3.1 ALIGNMENT OF EDGES: LAY ALL ASPHALTIC CONCRETE MIXTURES, INCLUDING LEVELING COURSES OTHER THAN ADJACENT TO CURB AND GUTTER AND OTHER TRUE EDGES, BY THE STRINGLINE METHOD TO OBTAIN AN ACCURATE, UNIFORM ALIGNMENT OF THE PAVEMENT EDGE.
10.3.2 TEMPERATURE OF SPREADING: THE CONTRACTOR SHALL MAINTAIN THE TEMPERATURE OF THE MIX AT THE TIME OF SPREADING TO WITHIN +/- 24° F [+/- 14° C] OF THE ESTABLISHED MIX TEMPERATURE ESTABLISHED BY THE CONTRACTOR. AS A MINIMUM, THE ENGINEER WILL TAKE MIX TEMPERATURES OF THE MIX ON THE ROAD IN AN AVERAGE FREQUENCY OF ONE PER FIVE TRUCKS. IF THE TEMPERATURE FAILS TO FALL WITHIN SPECIFIED TOLERANCE CORRECTIVE ACTION MAY NEED TO BE TAKEN.
10.3.3 RAIN AND SURFACE CONDITIONS: IMMEDIATELY CEASE TRANSPORTATION OF ASPHALT MIXTURES FROM THE PLANT WHEN RAIN BEGINS AT THE ROADWAY. DO NOT PLACE ASPHALT MIXES WHILE RAIN IS FALLING, OR WHEN THERE IS WATER ON THE SURFACE TO BE COVERED. AS AN EXCEPTION, THE CONTRACTOR MAY PLACE MIXTURES CAUGHT IN TRANSIT AT THE CONTRACTOR'S RISK IF THE ONLY OPTION IS TO WASTE THE MIXTURE AND PROVIDED THE SURFACE HAS BEEN TACKED AS SPECIFIED PRIOR TO THE RAIN AND THE SURFACE IS BROOMED IN FRONT OF THE SPREADING OPERATION.
10.4 COMPACTING MIXTURE
10.4.1 STANDARD ROLLING PROCEDURE: CONTRACTOR SHALL MEET THE FOLLOWING EQUIPMENT, SEQUENCE , AND COVERAGE REQUIREMENTS:
1. SEAL ROLLING: PROVIDE TWO COVERAGES WITH A TANDEM STEEL-WHEELED ROLLER (EITHER VIBRATORY OR STATIC), WEIGHING 5 TO 12 TONS [4.5 TO 11 METRIC TONS]. FLOOLWING AS CLOSE BEHIND THE SPREADER AS POSSIBLEWITHOUT PICK-UP, UNDUE DISPLACEMENT OR BLISTERING OF THE MATERIAL. USE VIBRATORY ROLLERS IN THE STATIC MODE FOR LAYERS OF 1 INCH [25MM] OR LESS IN THICKNESS.
2. INTERMEDIATE ROLLING: PROVIDE FIVE COVERAGES WITH A SEFL-PROPELLED PNEUMATIC-TIRED ROLLER, FOLLOWING AS CLOSE BEHIND THE SEAL ROLLNG OPERATION AS THE MIX WILL PERMIT.
3. FINAL ROLLING: PROVIDE ONE COVERAGE WITH A TANDUM STEEL-WHEELED ROLLER (STATIC MODE ONLY), WEIGHING 5 TO 12 TONS [4.5 TO 11 METRIC TONS], AFTER COMPLETING THE SEAL ROLLING AND INTERMEDIATE ROLLING, BUT BEFORE THE SURFACE PAVEMENT TEMPERATURE DROPS BELOW 160° F [70°C].
10.4.2 ROLLING PROCEDURES: ENSURE THAT THE INITI

2.2.5 CONSTRUCTION TRAFFIC SHALL NOT USE ANY ROAD FORMATION AT THE BOTTOM OF A CUTTING UNLESS THE CUTTING IS IN ROCK OR THE CONTRACTOR MAINTAINS THE LEVEL OF THE BOTTOM SURFACE AT LEAST 1 FOOT ABOVE FORMATION LEVEL.
THE CONTRACTOR AT HIS OWN EXPENSE SHALL REPAIR ANY DAMAGE TO THE SUB-GRADE ARISING FROM SUCH USE OF THE SURFACE.

2.3 PREPARATION OF FILL AREAS: UNLESS OTHERWISE REQUIRED BY THE CONTRACT THE NATURAL GROUND OVER WHICH FILLING IS TO BE PLACE SHALL BE CLEARED OF ALL LOOSE BOULDERS, GRASS, PRODUCTIVE SOIL, BUSHES, TREES, ROOTS AND OTHER VEGETATION. NO FILLING MATERIAL SHALL BE PLACED UNTIL ALL WATERCOURSES HAVE BEEN DIVERTED OR UNDER DRAINED. ALL POTHOLES OR CAVITIES DISCOVERED SHALL BE OPENED UP, FILLED AND COMPACTED BEFORE ANY FILLING TAKES PLACE.

2.4 FORMING OF EMBANKMENTS: ALL FILLING MATERIAL SHALL BE OBTAINED FROM APPROVED BORROW AREAS OR FROM OTHER SOURCES APPROVED BY THE PROJECT ENGINEER.

2.4.1 EMBANKMENTS SHALL BE FORMED OF MATERIAL DEFINED AS SUITABLE MATERIAL IN CLAUSE 4.1 THE MATERIAL SHALL BE DEPOSITED AND COMPACTED AS SOON AS PRACTICABLE AFTER EXCAVATION IN ACCORDANCE WITH CLAUSE 4.7. EMBANKMENTS SHALL BE BUILT UP EVENLY OVER THE FULL WIDTH AND SHALL BE MAINTAINED AT ALL TIMES WITH A SURFACE OF SUFFICIENT CAMBER AND SUFFICIENTLY EVEN TO ENABLE SURFACE WATER TO DRAIN READILY FROM THEM. DAMAGE TO COMPACTED LAYERS BY CONSTRUCTION TRAFFIC SHALL BE REPAIRED BY THE CONTRACTOR.

2.4.2 THE EXISTING GROUND BELOW EMBANKMENT AREAS SHALL BE CLEARED AS SPECIFIED IN 2.4, AND THEN RIPPED TO A DEPTH OF TWELVE INCHES (12") BELOW EXISTING GROUND LEVEL. THE RIPPED ROCK SHALL THEN BE WELL WALKED IN UNTIL IT WILL PASS A 4" GAUGE AND THOROUGHLY COMPACTED IN ACCORDANCE WITH TABLE 2.1.

2.4.3 ROCK USED, AS FILL SHALL BE OF SUCH SIZE THAT IT CAN BE DEPOSITED IN HORIZONTAL LAYERS, EACH NOT EXCEEDING 18 INCHES LOOSE DEPTH AND EXTENDING OVER THE FULL WIDTH OF THE EMBANKMENTS. MATERIALS SHALL BE SPREAD AND LAID BY A CRAWLER TRACTOR WEIGHING NOT LESS THAN 15 TONS AND COMPACTED IN ACCORDANCE WITH CLAUSE 3.2. EACH LAYER SHALL CONSIST OF REASONABLY GRADED ROCK AND ALL SURFACE VOIDS SHALL BE FILLED WITH BROKEN FRAGMENTS BEFORE THE NEXT LAYER IS PLACED. THE TOP SURFACE AND SIDE SLOPES OF EMBANKMENTS SO FORMED SHALL BE THOROUGHLY BLINDED WITH APPROVED FINE GRADED MATERIALS TO SEAL THE SURFACE.

2.4.4 IF THE CONTRACTOR WISHES TO CONTINUE TO USE THE SURFACE OF EMBANKMENTS FOR CONSTRUCTION TRAFFIC BEFORE TRIMMING TO FORMATION LEVEL HE SHALL BRING UP AND MAINTAIN THE SURFACE TO A LEVEL NOT LESS THAN 6 INCHES ABOVE FORMATION LEVEL. ANY DAMAGE TO THE SUBGRADE CAUSE BY THE USE OF SUCH SURFACE SHALL BE MADE GOOD BY THE CONTRACTOR AT HIS OWN EXPENSE.

2.5 COMPACTION
ALL MATERIAL SHALL BE COMPACTED AS SOON AS PRACTICABLE AFTER DEPOSITION. THE PERCENTAGE COMPACTION SHALL EQUAL OR EXCEED 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY.
AS A GUIDELINE TABLE 2.1 GIVES COMPACTION REQUIREMENTS FOR TYPES OF EQUIPMENT, DEPTH OF LAYER AND NUMBER OF PASSES. LISTED BELOW ARE THE DEFINITIONS AND CLASSIFICATIONS ASSOCIATED WITH TABLE 2.1

TABLE 2.1 COMPACTION REQUIREMENTS
D= MAXIMUM DEPTH OF COMPACTED LAYER (INCHES)
N= MINIMUM NUMBER OF PASSES

TYPE OF COMPACTION PLANT	CATEGORY	UNIFORMLY GRADED MATERIAL	
MASS PER YD WIDTH OF ROLL:		D	N
SMOOTH-WHEELED ROLLER	OVER 0.71T UP TO 0.91T	5	10*
	OVER 0.91T UP TO 1.80T	5	8*
	OVER 1.81T	UNSUITABLE	
GRID ROLLER	OVER 0.91T UP TO 1.81T	6	10*
	OVER 1.81T UP TO 1.82T	UNSUITABLE	
	OVER 1.82T	UNSUITABLE	
TAMPING ROLLER	OVER 4.41T	10	4
VIBRATING ROLLER	MASS PER YARD WIDTH OF A VIBRATING ROLL:		
	OVER 0.09T UP TO 0.15T	6	16
	OVER 0.15T UP TO 0.24T	6	12
	OVER 0.24T UP TO 0.44T	6	6
	OVER 0.44T UP TO 0.60T	8	10*
	OVER 0.60T UP TO 0.77T	9	12*
	OVER 0.77T UP TO 0.97T	10	10*
	OVER 0.97T UP TO 1.21T	11	8*
	OVER 1.21T UP TO 1.44T	12	8*
	OVER 1.44T UP TO 1.68T	12	6*
	OVER 1.68T	12	4*

2.6 NOTES TO TABLE 2.1

A) THE DEPTH OF COMPACTED LAYER IS THE HEIGHT BY WHICH THE EMBANKMENT IS RAISED BY EACH SUCCESSIVE COMPACTED LAYER.

B) THE NUMBER OF PASSES IS THE NUMBER OF TIMES THAT EACH POINT ON THE SURFACE OF THE LAYER BEING COMPACTED HAS BEEN TRAVERSED BY THE ITEM OF COMPACTION PLANT.

C) THE COMPACTIVE EFFORT OF EACH COMPACTOR IS A FUNCTION OF THE MASS OF THE MACHINE AND THE COMPACTION PLANT IN TABLE 2.1 IS LISTED IN TERMS OF THEIR MASSES. THE MASS PER YARD WIDTH OF ROLL IS THE TOTAL MASS ON THE ROLL DIVIDED BY THE TOTAL ROLL WIDTH. WHERE A SMOOTH-WHEELED ROLLER HAS MORE THAN ONE AXLE. THE MACHINE SHALL BE ASSESSED ON THE BASIS OF THE AXLE GIVING THE HIGHEST VALUE OF MASS PER YARD WIDTH.

D) A TAMPING ROLLER, FOR THE PURPOSE OF THIS SPECIFICATION, IS A MACHINE WITH A ROLL OR ROLLS FROM WHICH 'FEET' PROJECT. THE PROJECTED END AREA OF EACH FOOT SHALL EXCEED 0.11SQ.FT AND THE SUM OF THE AREAS OF FEET SHALL EXCEED 15 PER CENT OF THE AREA OF THE CYLINDER SWEPT BY ENDS OF THE FEET. THE REQUIREMENTS FOR TAMPING ROLLERS APPLY TO MACHINES THAT HAVE 2 ROLLS IN TANDEM. IF ONLY ONE TAMPING ROLL TRAVERSES EACH POINT ON THE SURFACE OF THE LAYER ON ANY ONE PASS OF THE MACHINE, THE MINIMUM NUMBER OF PASSES SHALL BE TWICE THE NUMBER GIVEN IN TABLE 2.1

E) FOR PNEUMATIC-TYRED ROLLERS MASS PER WHEEL IS THE TOTAL MASS OF THE ROLLER DIVIDED BY THE NUMBER OF WHEELS.

F) IN ASSESSING THE NUMBER OF PASSES OF PNEUMATIC-TYRED ROLLER THE EFFECTIVE WIDTH SHALL BE THE SUM OF THE WIDTHS OF THE INDIVIDUAL WHEEL TRACKS TOGETHER WITH THE SUM OF THE SPACING NOT EXCEEDING 10 INCHES. WHERE THE SPACING EXCEEDS 10 INCHES THE EFFECTIVE WIDTH SHALL BE THE SUM OF THE WIDTHS OF THE INDIVIDUAL WHEEL TRACKS ONLY.

G) VIBRATING ROLLERS ARE SELF-PROPELLED OR TOWED SMOOTH WHEELED ROLLERS HAVING MEANS OF APPLYING MECHANICAL VIBRATION TO ONE OR MORE ROLLS.

H) THE REQUIREMENTS FOR VIBRATING ROLLERS ARE BASED ON THE USE OF THE LOWEST GEAR ON A SELF-PROPELLED MACHINE WITH MECHANICAL TRANSMISSION AND A SPEED OF 0.93 -1.55 MPH FOR A TOWED MACHINE, OR A SELF-PROPELLED MACHINE WITH HYDROSTATIC TRANSMISSION. IF HIGHER GEAR SPEEDS ARE USED AN INCREASED NUMBER OF PASSES SHALL BE PROVIDED IN PROPORTION TO THE INCREASE ON SPEED TO TRAVEL.

I) WHERE THE MECHANICAL VIBRATING IS APPLIED TO TWO ROLLS IN TANDEM, THE MINIMUM NUMBER OF PASSES SHALL BE HALF THE NUMBER GIVEN IN TABLE 2.1 FOR THE APPROPRIATE MASS PER YARD WIDTH OF THE ONE VIBRATING ROLL. IF ONE ROLL DIFFERS IN MASS PER YARD WIDTH FROM THE OTHER THE NUMBER OF PASSES SHALL BE CALCULATED AS FOR THE ROLL WITH THE SMALLEST VALUE. ALTERNATIVELY THE MACHINE MAY BE TREATED AS HAVING A SINGLE VIBRATING ROLL MISSING LINE WITH THE HIGHER VALUE.

J) VIBRATING TYPE ROLLERS OPERATING WITHOUT VIBRATION WILL BE CLASSIFIED AS SMOOTH-WHEELED ROLLERS.

K) VIBRATING ROLLERS SHALL BE OPERATED WITH THEIR VIBRATORY MECHANISM OPERATING ONLY AT THE FREQUENCY OF VIBRATION RECOMMENDED BY THE MANUFACTURERS. ALL SUCH ROLLERS SHALL BE EQUIPPED OR PROVIDED WITH A DEVICE AUTOMATICALLY INDICATING THE FREQUENCY AT WHICH THE MECHANISM IS OPERATING.

L) VIBRATING-PLATE COMPACTORS ARE MACHINES HAVING A BASE PLATE TO WHICH IS ATTACHED A SOURCE OF VIBRATION CONSISTING OF ONE OR TWO ECCENTRICALLY WEIGHTED SHAFTS.

M) THE MASS PER UNIT AREA OF BASE-PLATE OF A VIBRATING PLATE COMPACTOR IS CALCULATED BY DIVIDING THE TOTAL MASS OF THE MACHINE IN IT'S WORKING CONDITION BY IT'S AREA IN CONTACT WITH COMPACTED SOIL.

N) VIBRATING-PLATE COMPACTORS SHALL BE OPERATED AT THE FREQUENCY OF VIBRATION RECOMMENDED BY THE MANUFACTURERS. THEY SHALL NORMALLY BE OPERATED AT TRAVELLING SPEEDS OF LESS THAN 0.62MPH BUT IF HIGHER SPEEDS ARE NECESSARY THE NUMBER OF PASSES SHALL BE INCREASED IN PROPORTION TO THE INCREASE IN SPEED OF TRAVEL.

O) VIBRO-TAMPERS ARE MACHINES IN WHICH AN ENGINE-DRIVEN RECIPROCATING MECHANISM ACTS ON A SPRING SYSTEM THROUGH WHICH OSCILLATIONS ARE SET UP IN A BASE-PLATE.

P) POWER RAMMERS ARE MACHINES, WHICH ARE ACTUATED BY EXPLOSIONS IN AN INTERNAL COMBUSTION CYLINDER, EACH EXPLOSION BEING CONTROLLED MANUALLY BY THE OPERATOR.

Q) IN THE CASE OF POWER RAMMERS AND DROPPING WEIGHT COMPACTORS ONE PASS WILL BE CONSIDERED AS MADE WITH THE COMPACTING SHOE HAS MADE ON STRIKE ON THE AREA IN QUESTION.

R) FOR ITEMS MARKED * THE ROLLERS SHALL BE TOWED BY TRACK LAYING TRACTORS. SELF-PROPELLED ROLLERS ARE UNSUITABLE.

S) WHERE COMBINATIONS OF DIFFERENT TYPES OF CATEGORIES OF PLANT ARE USED, THE COMPACTION REQUIREMENTS SHALL BE DECIDED UPON BY THE PROJECT ENGINEER, IN ACCORDANCE WITH TABLE 2.1.

2.7 SUB-GRADE
AT SECTIONS TO BE RECONSTRUCTED OR WHERE CUTTING IS REQUIRED, THE EXISTING FORMATION SHALL BE SCARIFIED TO A DEPTH OF 6" BELOW FORMATION LEVEL.
THE SCARIFIED MATERIAL SHALL THEN BE SHAPED AND ROUGH GRADED, WATERED AND COMPACTED IN ACCORDANCE WITH TAB 6.1 AFTER HARD PLANNING TO ACHIEVE THE REQUIRED CROSS-FALL A FURTHER ROLLING OF ANY LOOSE MATERIAL SHALL BE CARRIED OUT UNTIL A SMOOTH SURFACE LAYER IS ACHIEVED, EXCEPT FOR VERGES. THEY SHALL BE LEFT WITH A ROUGH SURFACE TO RECEIVE THE SUBSEQUENT BASE LAYER.

2.8 BACKFILLING TO RETAINING WALLS
BACKFILL TO RETAINING WALLS SHALL BE PLACED IN LAYERS NOT EXCEEDING NINE INCHES (9") THICK AND THOROUGHLY, BUT NOT EXCESSIVELY, COMPACTED. IF NECESSARY THE MATERIAL SHALL BE WATERED.

2.9 SETTLEMENT
THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING GOOD TO THE SATISFACTION OF THE PROJECT ENGINEER ALL SETTLEMENT IN FILLING AND IN BACKFILLING THAT MAY OCCUR UP TO THE END OF THE PERIOD OF MAINTENANCE.

2.10 EARTHWORK TO BE KEPT FREE OF WATER
THE CONTRACTOR SHALL PROVIDE WHERE NECESSARY TEMPORARY WATER COURSE, DITCHES, DRAINS, PUMPING OR OTHER MEANS OF MAINTAINING THE EARTHWORKS FREE OF WATER. SUCH WORK SHALL INCLUDE CARRYING OUT THE WORK OF FORMING THE CUTTINGS AND EMBANKMENTS IN SUCH A MANNER THAT THEIR SURFACES HAVE AT ALL TIMES A SUFFICIENT MINIMUM CROSS FALL AND, WHERE PRACTICABLE, A SUFFICIENT LONGITUDINAL GRADIENT TO ENABLE THEM TO SHED WATER AND PREVENT PONDING.

3 ROAD WORK
3.1 ALL MATERIAL WITHIN THE ROAD ALLOWANCE SHALL BE COMPACTED TO THE SATISFACTION OF THE PROJECT ENGINEER.
3.2 MINIMUM ACCEPTABLE COMPACTION REQUIREMENTS SHALL BE AS FOLLOWS:
3.2.1 ROAD SUB-GRADE 24" BELOW ROAD SUB-BASE OR GREATER: 95% STANDARD PROCTOR DENSITY
3.2.2 ROAD SUB-GRADE LESS THAN 24" BELOW ROAD SUB-BASE: 98% STANDARD PROCTOR DENSITY
3.2.3 ROAD SUB-BASE & BASE: 100% STANDARD PROCTOR DENSITY
D, ASPHALT BASE OR SURFACE COURSE: 97% OF MIX DESIGN DENSITY REGARDLESS OF DEPTH OF ASPHALT BEING PLACED.

3.3. SUB-GRADE PREPARATION: THE ENTIRE ROAD RESERVATION SHALL BE RIPPED ALL OVER TO A DEPTH OF 6" BELOW FORMATION LEVEL; THE RIPPED STONE SHALL THEN BE WELL WALKED IN UNTIL ALL PASS A 4" SCREEN. THE RIPPED STONE SHALL THEN BE ROUGH GRADED, SHAPED, WATERED AND THOROUGHLY COMPACTED TO AT LEAST 95% STANDARD PROCTOR DENSITY. A FURTHER ROLLING OF ANY LOOSE MATERIAL SHALL BE CARRIED OUT UNTIL A SMOOTH SURFACE IS ACHIEVED.

3.4 WHERE UNSTABLE OR ORGANIC SOIL IS FOUND TO EXIST BELOW THE PROPOSED ROAD SUB-BASE, ALL SUCH SOIL AND MATERIAL SHALL BE REMOVED TO A MINIMUM DEPTH OF 4' BELOW FINISH GRADE AND REPLACED WITH APPROVED MATERIAL AS DIRECTED BY THE PROJECT ENGINEER.

3.5 SUB-BASE AND BASE PREPARATION: CLEAN WELL-GRADED STONE FILL PASSING 2" MESH SHALL BE PLACED IN TWO LAYERS OF 4" EACH AND SEPARATELY COMPACTED TO SPECIFIED DENSITY AND PROPER CROSS FALL

3.6 ASPHALT COURSE: FLORIDA TYPE S-I AND S-III SPECIFICATION, AS PER FLORIDA DEPARTMENT OF TRANSPORTATION SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION 1982. A 1½" STRUCTURAL COURSE AND A ¾" SURFACE/FRICTION COURSE SHALL BE PLACED AND COMPACTED ACCORDING TO SPECIFIED DENSITY AND PROPER CROSS FALL.

REVISIONS

NO.	DATE	REMARKS

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CLIENT:
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PROJECT ADDRESS:
Parcel Nos. 3C-C-1
Estate Fortuna, Charlotte Amalie
St. Thomas, USVI 00801

DATE: August, 2024
DRAWN BY: DC
CHECKED BY: DC
APPROVED BY: DC

PROJECT NO.:
CONTRACT NO.:

SHEET NO.: C002

GENERAL NOTES



PARCEL No 3C-119

PARCEL No 3C-120

PARCEL No 3C-121

PARCEL No 3C-122

PARCEL No 3C-118

PARCEL No 3C-117

PARCEL No 3C-140

EDGE CONC ROAD

R138.00'
A146.12'

62.43'
N 74°00'00" E

30.27'

ROCKS

ROW PARCEL No 3C-J

R148.47'
A110.99'

ROW PARCEL No 3U-R

EDGE CONC ROAD

115.20'

S 45°20'06" E

PARCEL No 3C-C-1

1.432 AC

METER

CONC PAD

ASPHALT PAVEMENT

GARAGE

1 STORY WOOD BUILDING
FF 738.8'

1 STORY WOOD & MASONRY BUILDING
FF 729.9'

PORCH

SEPTIC

WALL

GARAGE

ASPHALT PARKING

WALL

A17.21'
R47.06'

S 00°14'56" W
33.38'

REM PORTION
PARCEL No 3C

R178.58'
A124.68'

N 48°43'31" W
174.58'

N 59°58'33" W
103.47'

S 50°15'00" W
91.64'

20.52'

20' WIDE ASPHALT PAVEMENT

PARCEL No 3B

PARCEL No 3C-C-REM

ROAD ROW

N

0 15 30 60

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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JDG Jaredian Design Group
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St. Thomas, USVI 00801

DATE: August, 2024
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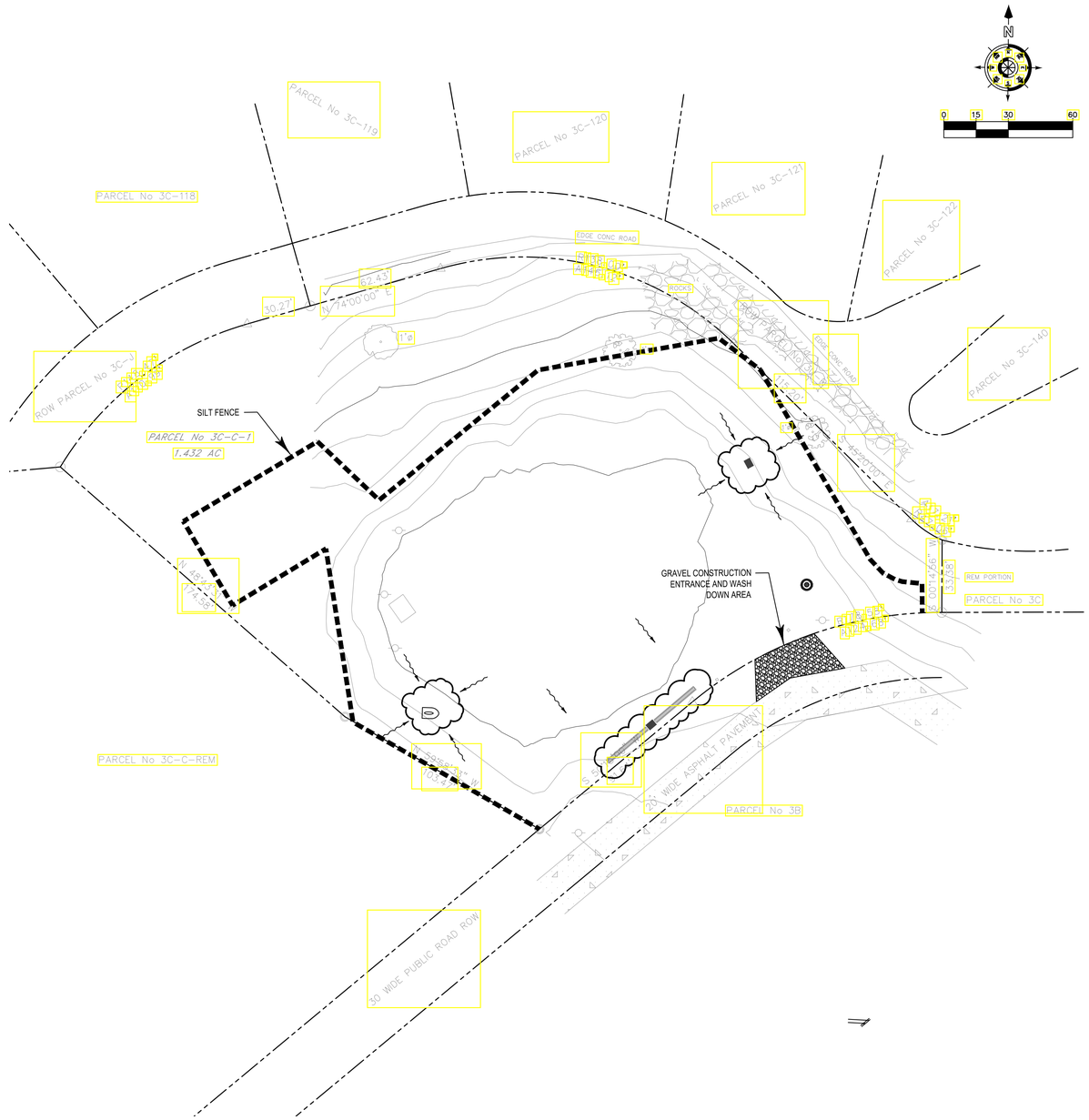
PROJECT NO.:

CONTRACT NO.:

SHEET NO.:
C003

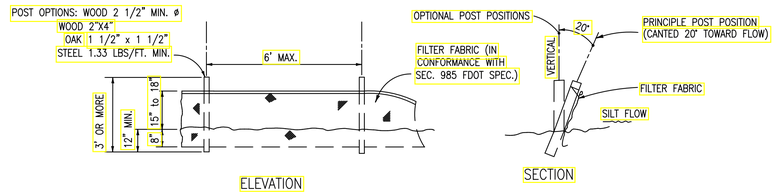
EXISTING CONDITION PLAN

PROFESSIONAL ENGINEER
DAMIAN CARTWRIGHT
28851-IB
VIRGIN ISLANDS



LEGEND

- PROPERTY LINE
- SILT FENCE
- DRAINAGE FLOW
- GRAVEL CONSTRUCTION ENTRANCE AND WASH DOWN AREA
- PLACE FILTER FABRIC BENEATH RIM OF NEW DRAINAGE INLETS AND HAY BALES AROUND PERIMETER OF NEW DRAINAGE INLETS

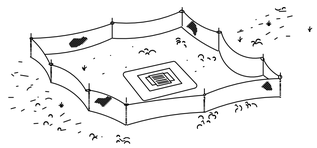


ELEVATION

SECTION

NOTE: SILT FENCE TO BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR STAKED SILT FENCE (LF).

TYPE III SILT FENCE

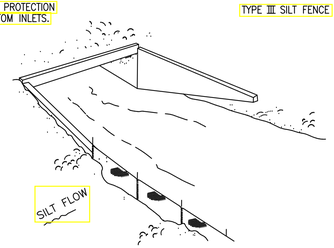


TYPE III SILT FENCE PROTECTION AROUND DITCH BOTTOM INLETS.



NOTE: SPACING FOR TYPE III FENCE TO BE IN ACCORDANCE WITH CHART I , SHEET 1 OF 3 AND DITCH INSTALLATIONS AI DRAINAGE STRUCTURES SHEET 2 OF 3.

TYPE III SILT FENCE



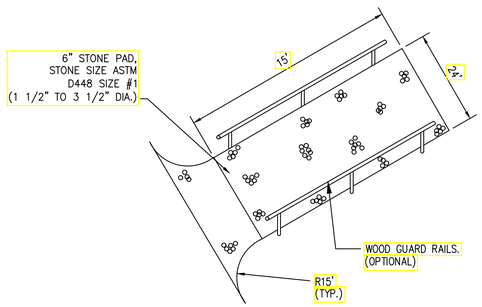
TYPE III SILT FENCE

DO NOT DEPLOY IN A MANNER THAT SILT FENCES WILL ACT AS A DAM ACROSS PERMANENT FLOWING WATERCOURSES. SILT FENCES ARE TO BE USED AT UPLAND LOCATIONS AND TURBIDITY BARRIERS USED AT PERMANENT BODIES OF WATER.

SILT FENCE APPLICATIONS

TYPE III SILT FENCE
AS PER FDOT STANDARD INDEX #102

DETAIL 1
SCALE



CONSTRUCTION ENTRANCE

DETAIL 2
SCALE

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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DATE:	August, 2024
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CONTRACT NO.:	
SHEET NO.:	C004

STORMWATER POLLUTION PREVENTION PLAN & DETAILS

PROFESSIONAL ENGINEER
DAMIAN CARTWRIGHT
28851-1B
REGISTERED

PARCEL No 3C-119

PARCEL No 3C-120

PARCEL No 3C-121

PARCEL No 3C-122

PARCEL No 3C-118

PARCEL No 3C-117

ROW PARCEL No 3C-J

PARCEL No 3C-140

EDGE CONC ROAD

R138.00'
A146.12'

62.43'
N 74°00'00" E

30.27'

R143.47'
A110.99'

ROCKS

EXISTING TREE TO REMAIN

1'Ø

N:845836.91
E:1149461.61

N:845851.59
E:1149544.87

N:845836.96
E:1149564.07

PARTIAL BOULDERS DEMOLITION

EXISTING TREE TO REMAIN

115.20'

EXISTING UTILITY POLE TO BE DEMOLISHED (TYP.)

EXISTING BUILDING TO BE DEMOLISHED (TYP.)

METER

PARCEL No 3C-C-1
1.432 AC

N:845803.95
E:1149359.94

N:845776.97
E:1149388.33

CONC PAD

ASPHALT PAVEMENT

GARAGE

1 STORY WOOD BUILDING FF 738.8'

1 STORY WOOD & MASONRY BUILDING FF 739.9'

TYPICAL

S 45°20'00" E

N:845767.18
E:1149298.13

SEPTIC

EXISTING UTILITY POLE TO REMAIN

N:845749.65
E:1149614.62

A17.27'
R47.06'

N:845743.37
E:1149620.51

N:845739.92
E:1149627.74

N:845738.49
E:1149638.55

N 48°43'31" W
174.58'

N:845754.54
E:1149363.83

N:845728.46
E:1149320.83

WALL

EXISTING BUILDING TO REMAIN

GARAGE

ASPHALT PARKING

EXISTING ROCK TO BE RELOCATED. COORDINATE NEW LOCATION WITH THE FIRE DEPARTMENT

S 00°14'56" W
33.38'

REM PORTION

PARCEL No 3C

R178.58'
A124.68'

N:845725.01
E:1149638.62

N:845725.20
E:1149647.64
(PARCEL CORNER BOUNDARY)

EXISTING UTILITY POLE TO REMAIN

N:845674.65
E:1149376.32

N 59°58'33" W
103.47'

S 50°15'00" W
91.64'

SAWCUT PAVEMENT ALONG THIS EDGE

20' WIDE ASPHALT PAVEMENT

PARCEL No 3C-C-REM

PARCEL No 3B

N:845625.33
E:1149462.20
(PARCEL CORNER BOUNDARY)

PUBLIC ROAD ROW

N

0 10 20 40

DEMOLITION LEGEND

- BUILDING DEMOLITION
- ASPHALTIC CONCRETE PAVEMENT DEMOLITION
- CLEARING & GRUBBING
- PARTIAL BOULDERS DEMOLITION
- UTILITY POLE DEMOLITION
- DISTURBED SITE / DEMOLITION LIMITS

REVISIONS

NO.	DATE	REMARKS
1	08-22-25	REVISIONS

CONSULTANTS

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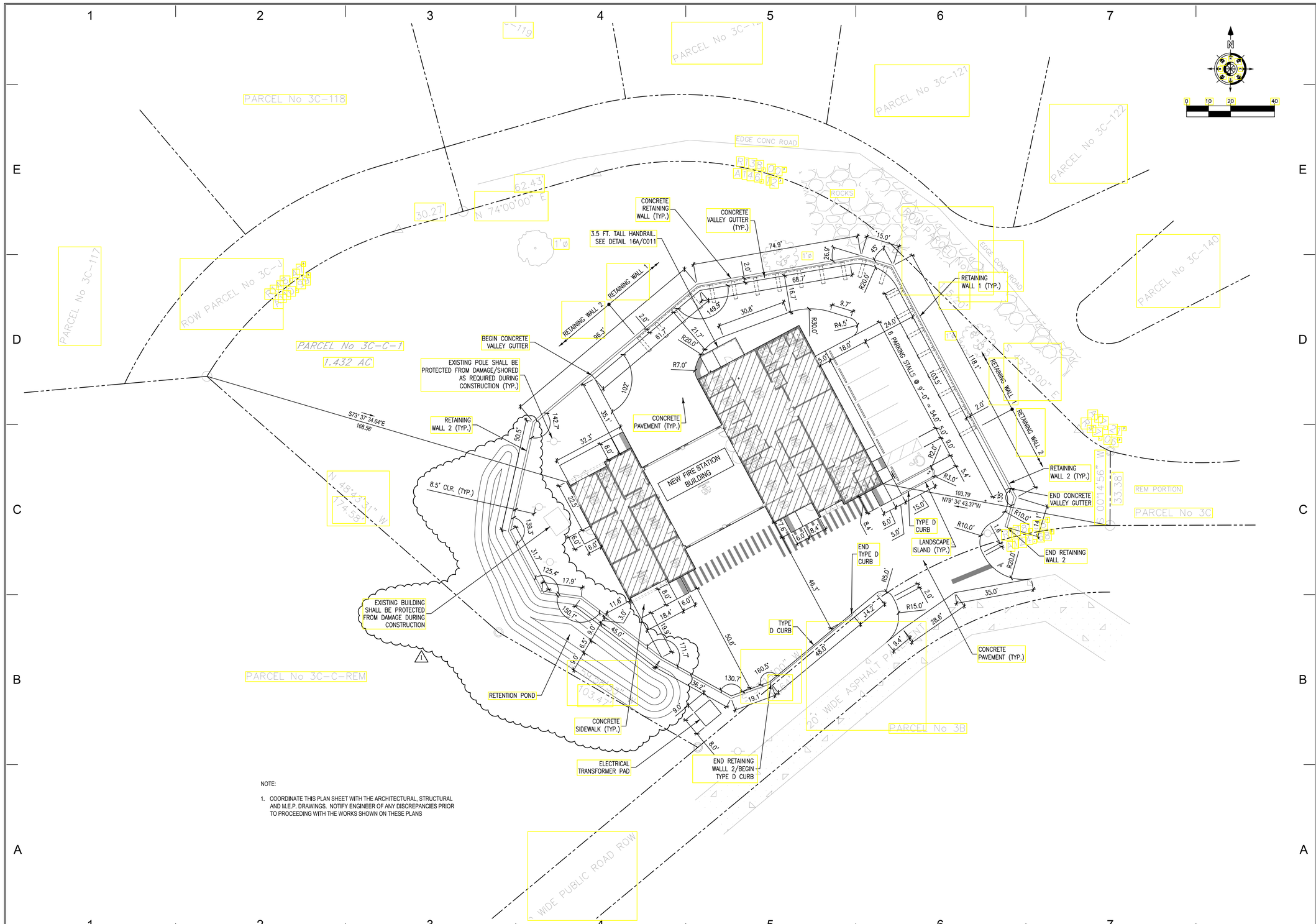
DATE: August, 2024
DRAWN BY: DC
CHECKED BY: DC
APPROVED BY: DC

PROJECT NO.:
CONTRACT NO.:

SHEET NO.:
DEMOLITION PLAN

C005

PROFESSIONAL ENGINEER
DAMIAN CARTWRIGHT
28851-IB
VIRGIN ISLANDS



NOTE:

1. COORDINATE THIS PLAN SHEET WITH THE ARCHITECTURAL, STRUCTURAL AND M.E.P. DRAWINGS. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORKS SHOWN ON THESE PLANS

REVISIONS

NO.	DATE	REMARKS
1	08-22-25	REVISIONS

CONSULTANTS

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CLIENT:
V.I. Fire & Emergency Management Services

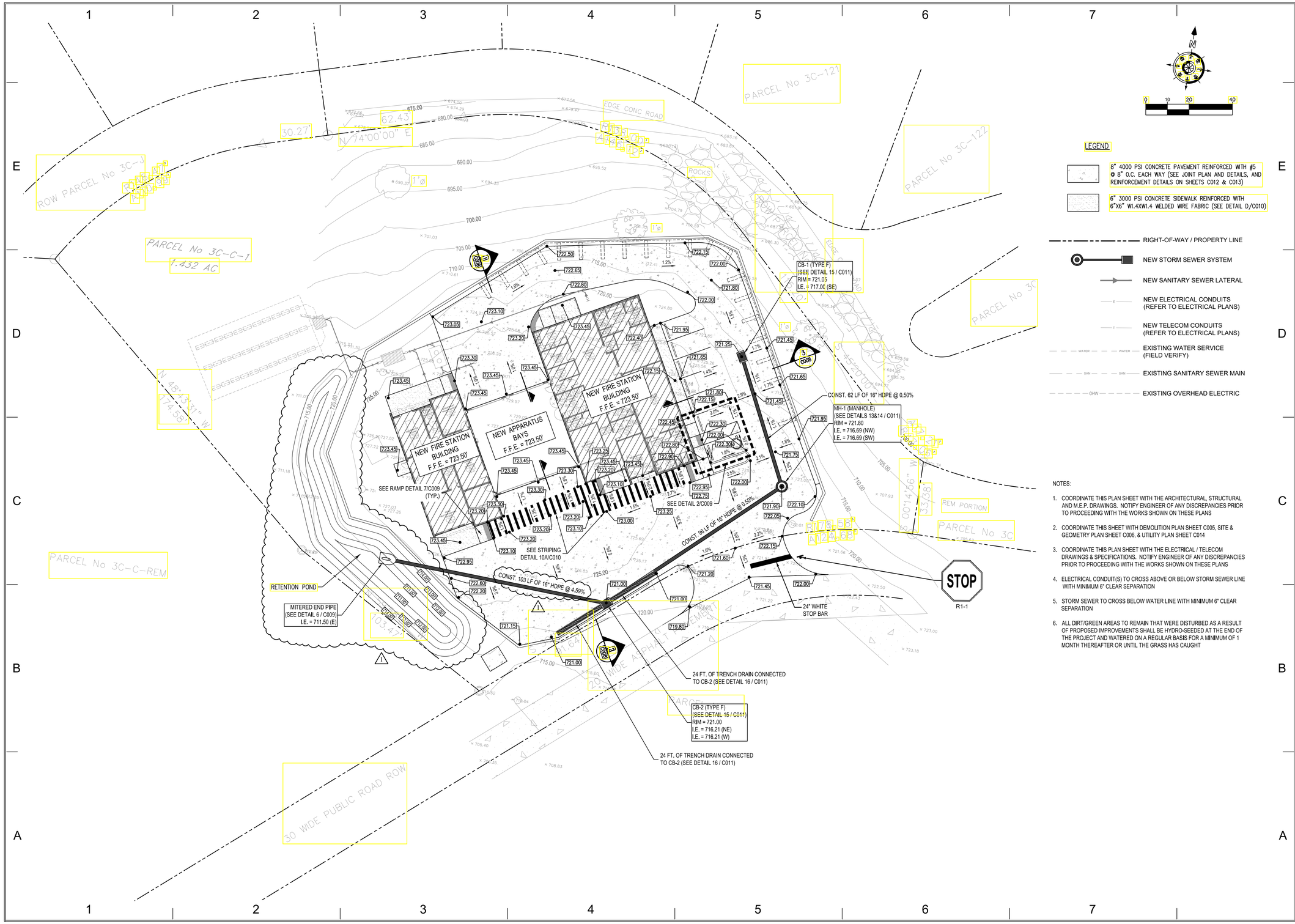
PROJECT ADDRESS:
Parcel Nos. 3C-C-1
Estate Fortuna, Charlotte Amalie
St. Thomas, USVI 00801

DATE: August, 2024
DRAWN BY: DC
CHECKED BY: DC
APPROVED BY: DC

PROJECT NO.:
CONTRACT NO.:

SHEET NO.:
SITE & GEOMETRY PLAN
C006

DAMIAN CARTWRIGHT 28851-1B
PROFESSIONAL ENGINEER
ST. THOMAS VIRGIN ISLANDS



LEGEND

- 8" 4000 PSI CONCRETE PAVEMENT REINFORCED WITH #5 @ 8" O.C. EACH WAY (SEE JOINT PLAN AND DETAILS, AND REINFORCEMENT DETAILS ON SHEETS C012 & C013)
- 6" 3000 PSI CONCRETE SIDEWALK REINFORCED WITH 6"X6" W1.4XW1.4 WELDED WIRE FABRIC (SEE DETAIL D/C010)
- RIGHT-OF-WAY / PROPERTY LINE
- NEW STORM SEWER SYSTEM
- NEW SANITARY SEWER LATERAL
- NEW ELECTRICAL CONDUITS (REFER TO ELECTRICAL PLANS)
- NEW TELECOM CONDUITS (REFER TO ELECTRICAL PLANS)
- EXISTING WATER SERVICE (FIELD VERIFY)
- EXISTING SANITARY SEWER MAIN
- EXISTING OVERHEAD ELECTRIC

NOTES:

1. COORDINATE THIS PLAN SHEET WITH THE ARCHITECTURAL, STRUCTURAL AND M.E.P. DRAWINGS. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORKS SHOWN ON THESE PLANS
2. COORDINATE THIS SHEET WITH DEMOLITION PLAN SHEET C005, SITE & GEOMETRY PLAN SHEET C006, & UTILITY PLAN SHEET C014
3. COORDINATE THIS PLAN SHEET WITH THE ELECTRICAL / TELECOM DRAWINGS & SPECIFICATIONS. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORKS SHOWN ON THESE PLANS
4. ELECTRICAL CONDUIT(S) TO CROSS ABOVE OR BELOW STORM SEWER LINE WITH MINIMUM 6" CLEAR SEPARATION
5. STORM SEWER TO CROSS BELOW WATER LINE WITH MINIMUM 6" CLEAR SEPARATION
6. ALL DIRT/GREEN AREAS TO REMAIN THAT WERE DISTURBED AS A RESULT OF PROPOSED IMPROVEMENTS SHALL BE HYDRO-SEEDED AT THE END OF THE PROJECT AND WATERED ON A REGULAR BASIS FOR A MINIMUM OF 1 MONTH THEREAFTER OR UNTIL THE GRASS HAS CAUGHT

REVISIONS

NO.	DATE	REMARKS
1	08-22-25	REVISIONS

CONSULTANTS

BUILDTEC
P.O. BOX 8269
Christiansted, USVI 00823

Jaredian Design Group
Architects, Engineers and Construction Managers
5143 Palm Passage,
Second Floor - Suites B24-25 St. Thomas,
US Virgin Islands 00802
Post Office Box 6218
St. Thomas, U.S. Virgin Islands 00804-6218
telephone: 340.777.1600
e-mail: jarediandesigngroup@gmail.com
website: www.jaredian.com

CLIENT:
V.I. Fire & Emergency Management Services

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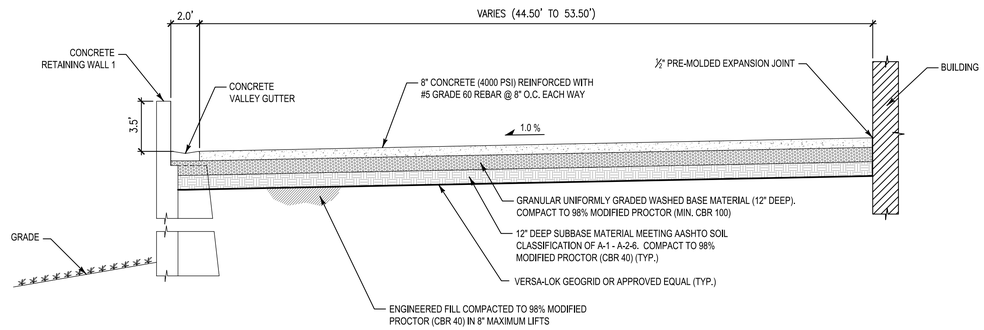
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APPROVED BY: DC

PROJECT NO.:
CONTRACT NO.:

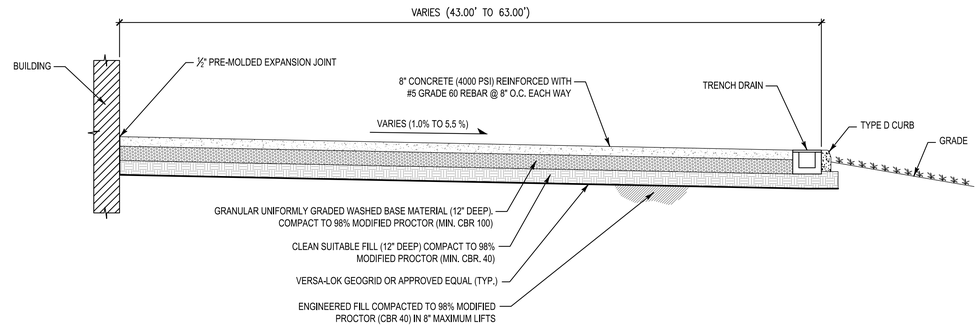
SHEET NO.:
PAVING, GRADING & DRAINAGE PLAN

C007

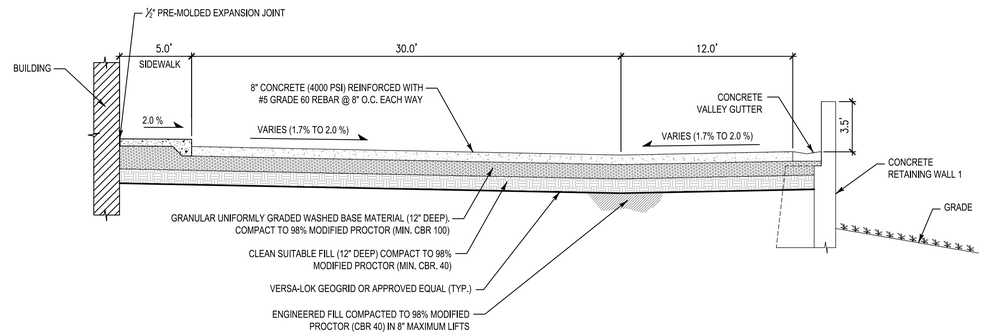
PROFESSIONAL ENGINEER
DAMIAN CARTWRIGHT
28851-18
VIRGIN ISLANDS



TYPICAL SECTION 1
N.T.S.



TYPICAL SECTION 2
N.T.S.



TYPICAL SECTION 3
N.T.S.

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

BUILDTEC
P.O. BOX 8269
Christiansted, USVI 00823

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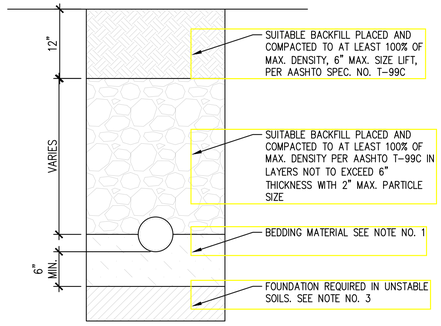
PROJECT ADDRESS:
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St. Thomas, USVI 00801

DATE: August, 2024
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CONTRACT NO.:

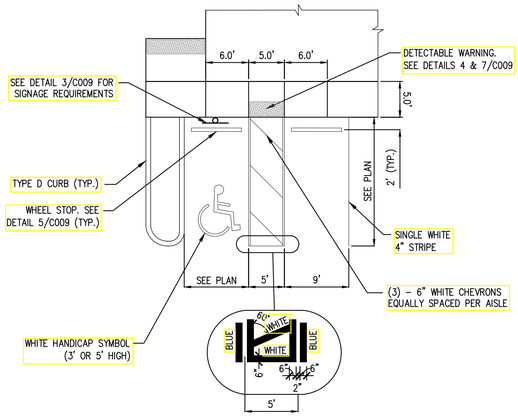
SHEET NO.:
TYPICAL SECTIONS
C008





NOTES:
1. UNLESS OTHERWISE SPECIFIED, BEDDING MATERIAL SHALL CONSIST OF SELECT BACKFILL MATERIAL 2" MAXIMUM PARTICLE SIZE, COMPACTED TO AT LEAST 100% OF MAX. DENSITY, 6" LIFTS, PER AASHTO SPEC. NO. T-99C
2. WHERE REQUIRED, SHEETING AND SHORING SHALL BE IN ACCORDANCE WITH OSHA REQUIREMENTS.
3. WHERE UNSTABLE SOILS ARE ENCOUNTERED, INCLUDING PEAT, MUCK OR OTHER ORGANIC SOILS, ELASTIC SILT AND CLAYS, A FOUNDATION IS REQUIRED AS DETERMINED BY THE ENGINEER.

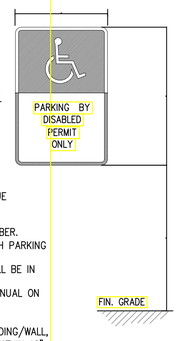
1 TYPICAL TRENCH BACKFILL
NOT TO SCALE



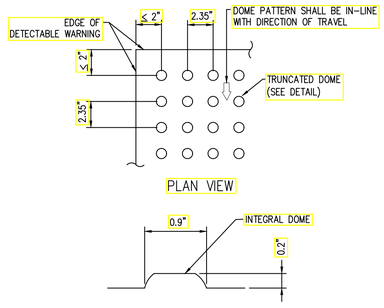
NOTE: FINISHED GRADES OF PAVEMENT IN HC PARKING AND ACCESSIBILITY AISLE SHALL NOT EXCEED 1:50 SLOPE IN ANY DIRECTION. SEE PLAN FOR STYLE OF HANDICAP RAMP
HANDICAP STRIPING SHALL CONFORM TO FDOT INDEX 17346 (LATEST EDITION)

2 HANDICAP STRIPING
N.T.S.

NOTES:
1. ALL LETTERS ARE 1" SERIES "C" PER MUTCD.
2. TOP PORTION OF SIGN SHALL HAVE A REFLECTORIZED (ENGINEERING GRADE) BLUE BACKGROUND WITH WHITE REFLECTORIZED LEGEND AND BORDER.
3. BOTTOM PORTION OF SIGN SHALL HAVE A REFLECTORIZED (ENGINEERING GRADE) WHITE BACKGROUND WITH BLACK OPAQUE LEGEND AND BORDER.
4. FINE NOTIFICATION SIGN SHALL HAVE A REFLECTORIZED (ENGINEERING GRADE) WHITE BACKGROUND WITH BLACK OPAQUE LEGEND & BORDER. CONTRACTOR SHALL VERIFY FINE AMOUNT & ORDINANCE NUMBER.
5. ONE(1) SIGN REQUIRED FOR EACH PARKING SPACE.
6. INSTALLED HEIGHT OF SIGN SHALL BE IN ACCORDANCE WITH SECTION 24-23 OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
7. SIGN MAY BE MOUNTED ON BUILDING/WALL, AT PROPER HEIGHT, IF ALIGNED WITHIN 12" OF CENTER OF PARKING SPACE.

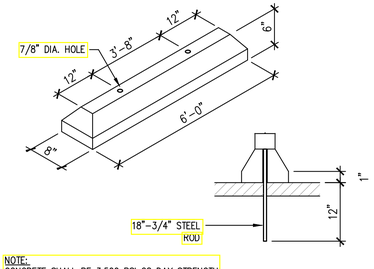


3 HANDICAP SIGN
N.T.S.



4 DETECTABLE WARNING
N.T.S.

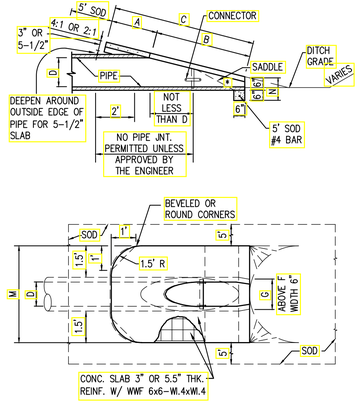
NOTE:
1. CURB RAMP RUNNING SLOPES SHALL NOT BE STEEPER THAN 1:12 AND CROSS SLOPE SHALL BE 0.02 OR FLATTER.
2. DETECTABLE WARNING SURFACES SHALL BE CONSTRUCTED BY TEXTURING OR APPLYING A TRUNCATED DOME MATERIAL IN CONFORMANCE WITH THE U.S. DEPARTMENT OF JUSTICE A.D.A. STANDARDS FOR ACCESSIBLE DESIGN, A.D.A. ACCESSIBILITY GUIDELINES, SECTION 4.29.2. TRANSITION SLOPES ARE NOT TO HAVE DETECTABLE WARNINGS.
3. WHERE A CURB RAMP IS CONSTRUCTED WITHIN AN EXISTING CURB, CURB AND GUTTER AND/OR SIDEWALK, THE EXISTING CURB OR CURB AND GUTTER SHALL BE REMOVED TO THE NEAREST JOINT BEYOND THE CURB TRANSITIONS OR TO THE EXTENT THAT NO REMAINING SECTION OF CURB OR CURB AND GUTTER IS LESS THAN 5' LONG. THE EXISTING SIDEWALK SHALL BE REMOVED TO THE NEAREST JOINT BEYOND THE TRANSITION SLOPE WALK AROUND OR TO THE EXTENT THAT NO REMAINING SECTION OF SIDEWALK IS LESS THAN 5'.
4. WHERE ADJACENT WALKING SURFACES ARE COLORED OR ARE CONSTRUCTED WITH MATERIALS OTHER THAN STANDARD CLASS I PORTLAND CEMENT CONCRETE IN ACCORDANCE WITH SECTION 522 OF THE SPECIFICATIONS, THE PLAN MUST PROVIDE FOR DETECTABLE WARNING SURFACE COLORS OR MATERIALS THAT PROVIDE THE NECESSARY CONTRAST, EITHER DARK-ON-LIGHT OR LIGHT-ON-DARK. (SAFETY YELLOW OR BRICK RED)
5. RECOMMENDED MANUFACTURER: ENGINEERED PLASTICS, INC. (ARMOR TILE) OLYMPIC TOWERS, 300 PEARL STREET, SUITE 200, BUFFALO, NY 14202. PHONE: (800) 682-2525



NOTE:
CONCRETE SHALL BE 3,500 PSI 28 DAY STRENGTH

5 WHEEL STOP
N.T.S.

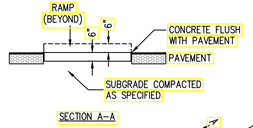
STORM SEWER PIPE LENGTHS NOTED IN THE DRAWINGS REFLECT ONLY THE PIPE ITSELF. WHERE A MITERED END SECTION IS INSTALLED ON SAID PIPE, ITS ADDITIONAL PIPE LENGTH SHALL BE INCLUDED IN THE COST OF THE MITERED END SECTION.

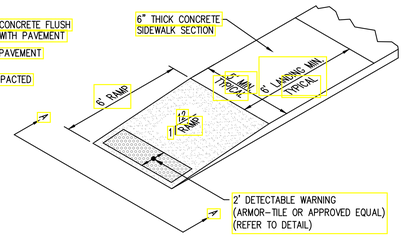


DIMENSIONS AND QUANTITIES											
								M			
	D	A	B	C	E	F	G	SINGLE PIPE	DOUBLE PIPE	TRIPLE PIPE	QUAD. PIPE
2:1 SLOPE	15"	1.92'	2.18'	4.10'	2.06'	5'	1.22'	4.63'	7.21'	9.79'	12.37'
	18"	1.97'	2.74'	4.71'	2.56'	6'	1.41'	4.92'	7.75'	10.58'	13.42'
	24"	2.06'	3.85'	5.91'	3.56'	7'	1.73'	5.50'	8.92'	12.33'	15.75'
	30"	2.15'	4.95'	7.10'	4.56'	8'	2.00'	6.08'	10.33'	14.58'	18.83'
	36"	2.25'	6.08'	8.33'	5.56'	9'	2.24'	6.67'	11.75'	16.83'	21.92'
	42"	2.34'	7.21'	9.55'	6.56'	10'	2.45'	7.25'	13.25'	19.25'	25.25'
	48"	2.43'	8.33'	10.76'	7.56'	11'	2.65'	7.83'	14.58'	21.33'	28.08'
	54"	2.52'	9.44'	11.96'	8.56'	12'	2.83'	8.42'	16.08'	23.75'	31.42'
	60"	2.62'	10.56'	13.18'	9.56'	14'	3.00'	9.00'	17.50'	26.00'	34.50'
	66"	2.71'	11.68'	14.39'	10.56'	15'	3.18'	9.58'	18.75'	27.92'	37.08'
	72"	2.80'	12.80'	15.60'	11.56'	16'	3.30'	10.16'	20.16'	30.16'	40.16'
4:1 SLOPE	15"	2.27'	4.09'	6.36'	4.03'	8'	1.22'	4.63'	7.21'	9.79'	12.37'
	18"	2.36'	5.12'	7.48'	5.03'	9'	1.41'	4.92'	7.75'	10.58'	13.42'
	24"	2.53'	7.18'	9.71'	7.03'	11'	1.73'	5.50'	8.92'	12.33'	15.75'
	30"	2.70'	9.25'	11.95'	9.03'	13'	2.00'	6.08'	10.33'	14.58'	18.83'
	36"	2.87'	11.31'	14.18'	11.03'	15'	2.24'	6.67'	11.75'	16.83'	21.92'
	42"	3.05'	13.37'	16.42'	13.03'	17'	2.45'	7.25'	13.25'	19.25'	25.25'
	48"	3.22'	15.43'	18.65'	15.03'	19'	2.65'	7.83'	14.58'	21.33'	28.08'
	54"	3.39'	17.49'	20.88'	17.03'	21'	2.83'	8.42'	16.08'	23.75'	31.42'
	60"	3.56'	19.55'	23.11'	19.03'	23'	3.00'	9.00'	17.50'	26.00'	34.50'
	66"	3.73'	21.62'	25.35'	21.03'	25'	3.18'	9.58'	18.75'	27.92'	37.08'
	72"	3.91'	22.68'	26.59'	23.03'	27'	3.30'	10.16'	20.16'	30.16'	40.16'

* SLOPE- 4:1 MITER - TO 2 PIPE FOR PIPES 18" AND SMALLER
2:1 FOR PIPES 24" AND LARGER
2:1 MITER - TO 0 PIPE FOR PIPES 18" AND SMALLER
1:1 FOR PIPES 24" AND LARGER

6 MITERED END SECTION (MES)
N.T.S.





NOTE 1:
REFERENCE FDOT INDEX 304, PAGE 1, GENERAL AND DESIGN NOTES FOR RAMPS IN R.O.W.

NOTE 2:
CONSTRUCT RAMP TO LEAST POSSIBLE SLOPE (MAX = 1:12). CROSS SLOPE OF RAMP AND LANDING SHALL NOT EXCEED 1:50.

NOTE 3:
RAMP GREATER THAN A 6" RISE REQUIRES HANDRAILS.

7 HANDICAP RAMP
N.T.S.

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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P.O. BOX 8269
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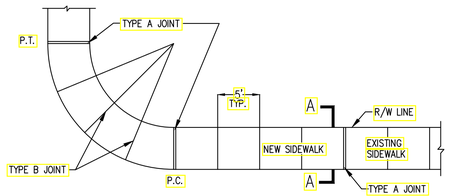
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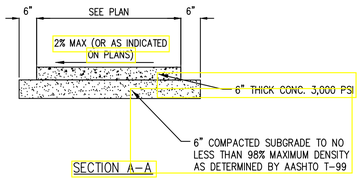
SHEET NO.:
PAVING, GRADING AND DRAINAGE DETAILS

C009





PLAN VIEW



SECTION A–A

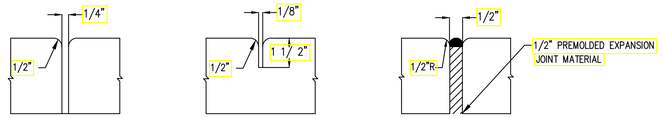
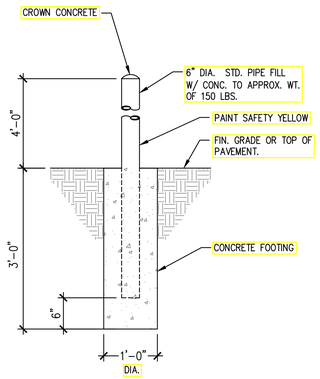


TABLE OF SIDEWALK THICKNESS – T	
LOCATION	
STANDARD SIDEWALK	6"

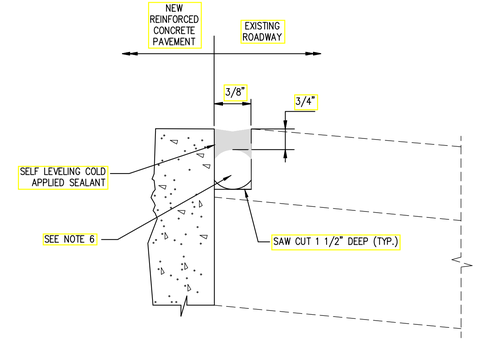
TABLE OF SIDEWALK JOINTS	
	LOCATION
A	P.C. AND P.T. OF CURVES. JUNCTION OF EXISTING AND NEW SIDEWALK.
B	5'–0" CENTER TO CENTER ON SIDEWALK.
C	WHERE SIDEWALK ABUTS CONCRETE CURBS, DRIVEWAYS, AND SIMILAR STRUCTURES.

NOTES:
1. PLACE W1.4XW1.4 6"x6" WIRE MESH IN THE SIDEWALK
2. STANDARD SIDEWALK TO BE 4000 PSI @ 28 DAYS
3. CURE ALL CONCRETE WITH CLEAN SAND, PLASTIC MEMBRANE, OR OTHER APPROVED METHOD.
4. TOOLED JOINTS TO OCCUR AT INTERVALS EQUAL TO WIDTH OF SIDEWALK
5. SIDEWALK TO HAVE BROOM FINISH PERPENDICULAR TO PATH OF TRAVEL.
6. CONTRACTOR SHALL REPAIR AND RESTORE ALL AREAS WITHIN THE ABUTTING R/W DISTURBED DURING CONSTRUCTION TO A CONDITION EQUAL TO OR BETTER THAN EXISTING AT NO ADDITIONAL COST TO THE OWNER.
7. ALL DEMOLISHED SIDEWALKS AND ADDITIONS ARE TO BE REPLACED WITH CONCRETE SIDEWALK TO MATCH EXISTING AT NO ADDITIONAL COST TO THE OWNER.
8. ALL DEMOLISHED SIDEWALK RAMPS ARE TO BE REPLACED AS PER ADA STANDARDS AND INCLUDE ADA COMPLIANT DETECTABLE WARNINGS AT NO ADDITIONAL COST TO THE OWNER.

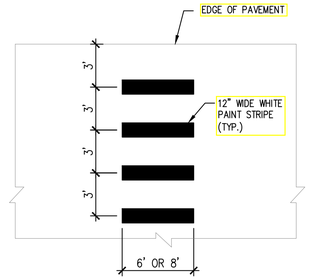
8 SIDEWALK DETAIL
N.T.S.



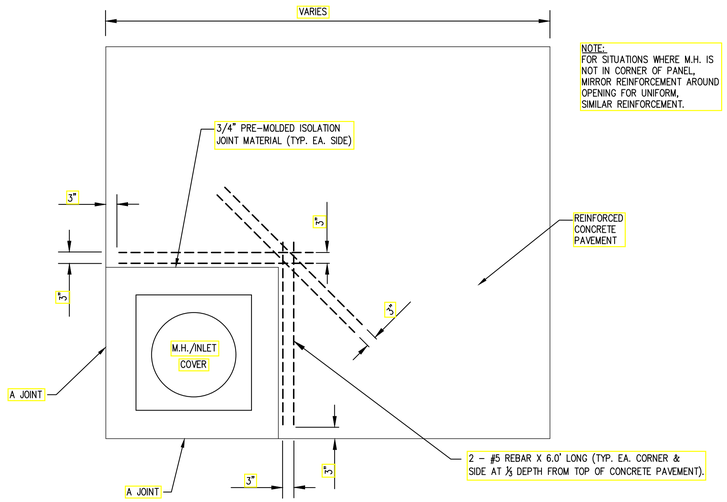
9 BOLLARD
N.T.S.



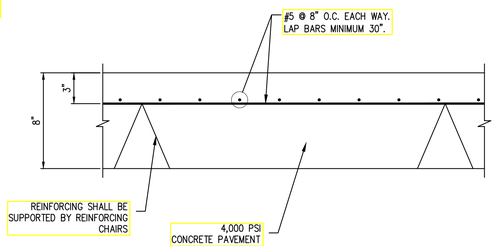
10 ASPHALT/CONCRETE PAVEMENT JOINT DETAIL
N.T.S.



10A SPECIAL EMPHASIS CROSSWALK MARKING DETAIL
N.T.S.



11 REINFORCING STEEL LAYOUT IN PAVEMENT SURROUNDING INLETS DETAIL
N.T.S.



MATERIAL SCHEDULE			
ITEM	SIZE	STANDARD	REMARKS
DOWELS	1 1/4 INCH DIA x 18 INCHES LONG @ 12 INCHES O.C.	ASTM A 615 GRADE 60	EPOXY COATED, INCLUDING ENDS, AASHTO M254
REINFORCED SLABS	#5 REBAR @ 8" O.C. EACH WAY	ASTM A 615 GRADE 60	USE 30 INCH OVERLAP
EXPANSION BOARD	1 INCH WIDTH x DEPTH REQUIRED	ASTM D 1751	USE REMOVABLE CAP FOR JOINT SEAL
DOWEL EPOXY	AS REQUIRED	ASTM C 881, TYPE IV, GRADE 3	CLASS C FOR INSTALLATION ABOVE 60 F CLASS B FOR INSTALLATION 40 F TO 60 F CLASS A FOR INSTALLATION BELOW 40 F
SILICONE SEALANT	SEE DETAILS	ASTM D 5893	TOOLED

12 REINFORCED CONCRETE PAVEMENT SECTION
N.T.S.

REVISIONS

NO.	DATE	REMARKS

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Estate Fortuna, Charlotte Amalie
St. Thomas, USVI 00801

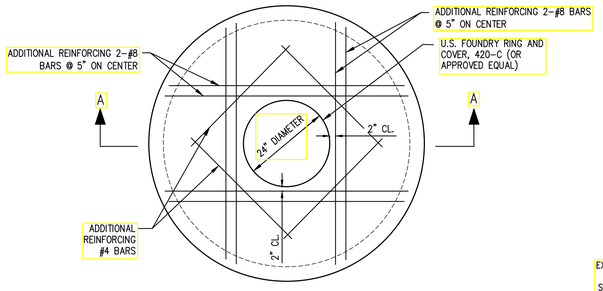
DATE: August, 2024
DRAWN BY: DC
CHECKED BY: DC
APPROVED BY: DC

PROJECT NO.:
CONTRACT NO.:

SHEET NO.:
PAVING, GRADING AND DRAINAGE DETAILS

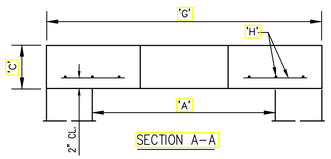
C010





PLAN

CONCRETE=4000 PSI @ 28 DAYS, TYPE II CEMENT



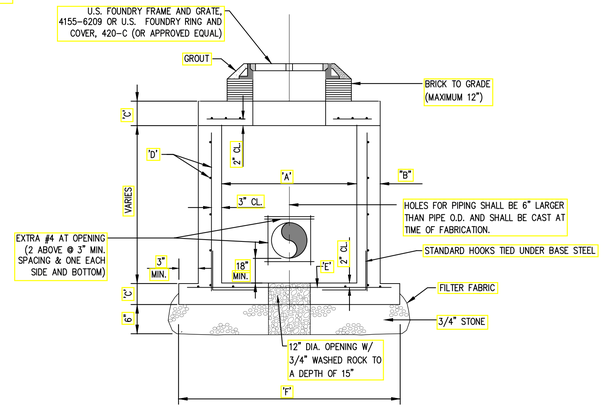
SECTION A-A

"A"	"C"	"G"	"H"
4'-0"	8"	5'-4"	# 4 @ 6" C.C.E.W.
5'-0"	8"	6'-4"	# 4 @ 6" C.C.E.W.
6'-0"	10"	7'-4"	# 5 @ 6" C.C.E.W.
7'-0"	10"	8'-4"	# 5 @ 6" C.C.E.W.
8'-0"	10"	9'-8"	# 5 @ 6" C.C.E.W.
10'-0"	12"	11'-8"	# 6 @ 5" C.C.E.W.

13 PRECAST CONCRETE MANHOLE TOP SLAB

NOT TO SCALE

REINFORCEMENT SHALL BE ASTM A615/A615M GRADE 60 STEEL



SECTION A-A

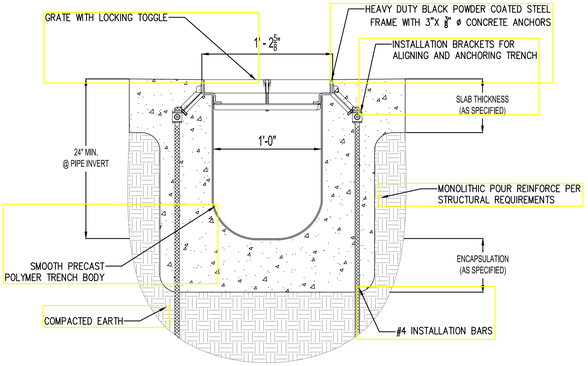
CONCRETE=4000 PSI @ 28 DAYS, TYPE II CEMENT

TYPE		"B"	"C"	"D"	"E"	"F"
P	3'-8" ø	6"	8"	#4 @ 12" C.C.E.W.	#4 @ 12" C.C.E.W.	4'-10"ø
C-4	4'-0" ø	8"	8"	#4 @ 12" C.C.E.W.	#4 @ 12" C.C.E.W.	6'-4" ø
C-5	5'-0" ø	8"	8"	#5 @ 12" C.C.E.W.	#5 @ 12" C.C.E.W.	7'-4" ø
C-6	6'-0" ø	8"	10"	#5 @ 12" C.C.E.W.	#5 @ 6" C.C.E.W.	8'-4" ø
C-7	7'-0" ø	8"	10"	#5 @ 12" C.C.E.W.	#5 @ 6" C.C.E.W.	9'-4" ø
C-8	8'-0" ø	10"	10"	#5 @ 12" C.C.E.W.	#5 @ 6" C.C.E.W.	10'-8" ø
C-10	10'-0" ø	10"	10"	#5 @ 12" C.C.E.W.	#5 @ 6" C.C.E.W.	12'-8" ø

14 PRECAST CIRCULAR DRAINAGE STRUCTURES

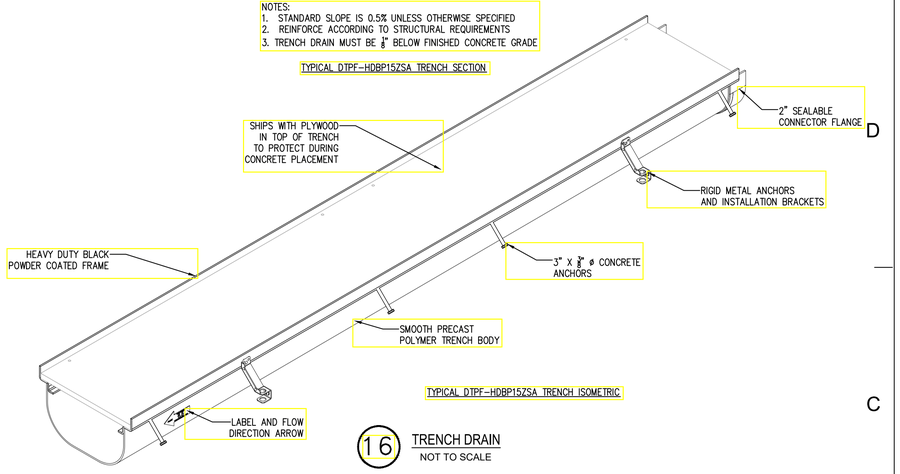
NOT TO SCALE

REINFORCEMENT SHALL BE ASTM A615/A615M GRADE 60 STEEL



NOTES:
1. STANDARD SLOPE IS 0.5% UNLESS OTHERWISE SPECIFIED
2. REINFORCE ACCORDING TO STRUCTURAL REQUIREMENTS
3. TRENCH DRAIN MUST BE 3/8" BELOW FINISHED CONCRETE GRADE

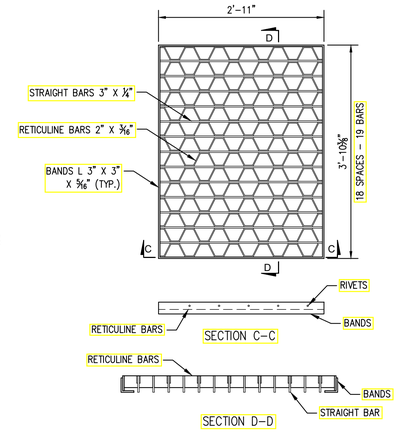
TYPICAL DTPF-HDBP15ZSA TRENCH SECTION

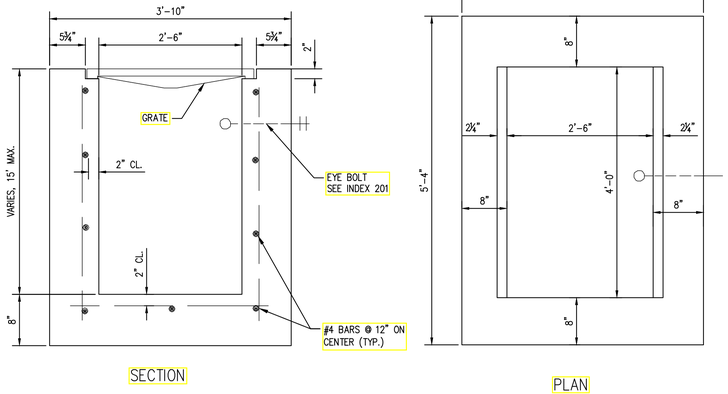


TYPICAL DTPF-HDBP15ZSA TRENCH ISOMETRIC

16 TRENCH DRAIN

NOT TO SCALE

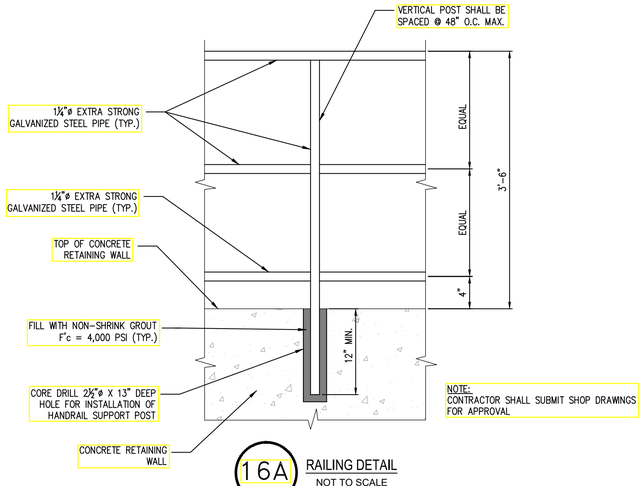




RECOMMENDED MAXIMUM PIPE SIZE:
2'-6" WALL 18" PIPE
4'-0" WALL 30" PIPE

15 TYPE F INLET

NOT TO SCALE



NOTE:
CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL

16A RAILING DETAIL

NOT TO SCALE

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

BUILDTEC
P.O. BOX 8269
Christiansted, USVI 00823

Jaredian Design Group
Architects, Engineers and Construction Managers
5143 Palm Passage,
Second Floor - Suites B24-25 St. Thomas,
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Post Office Box 6218
St. Thomas, U.S. Virgin Islands 00804-6218
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e-mail: jarediandesigngroup@gmail.com
website: www.jaredian.com

CLIENT:
V.I. Fire & Emergency Management Services

PROJECT ADDRESS:
Parcel Nos. 3C-C-1
Estate Fortuna, Charlotte Amalie
St. Thomas, USVI 00801

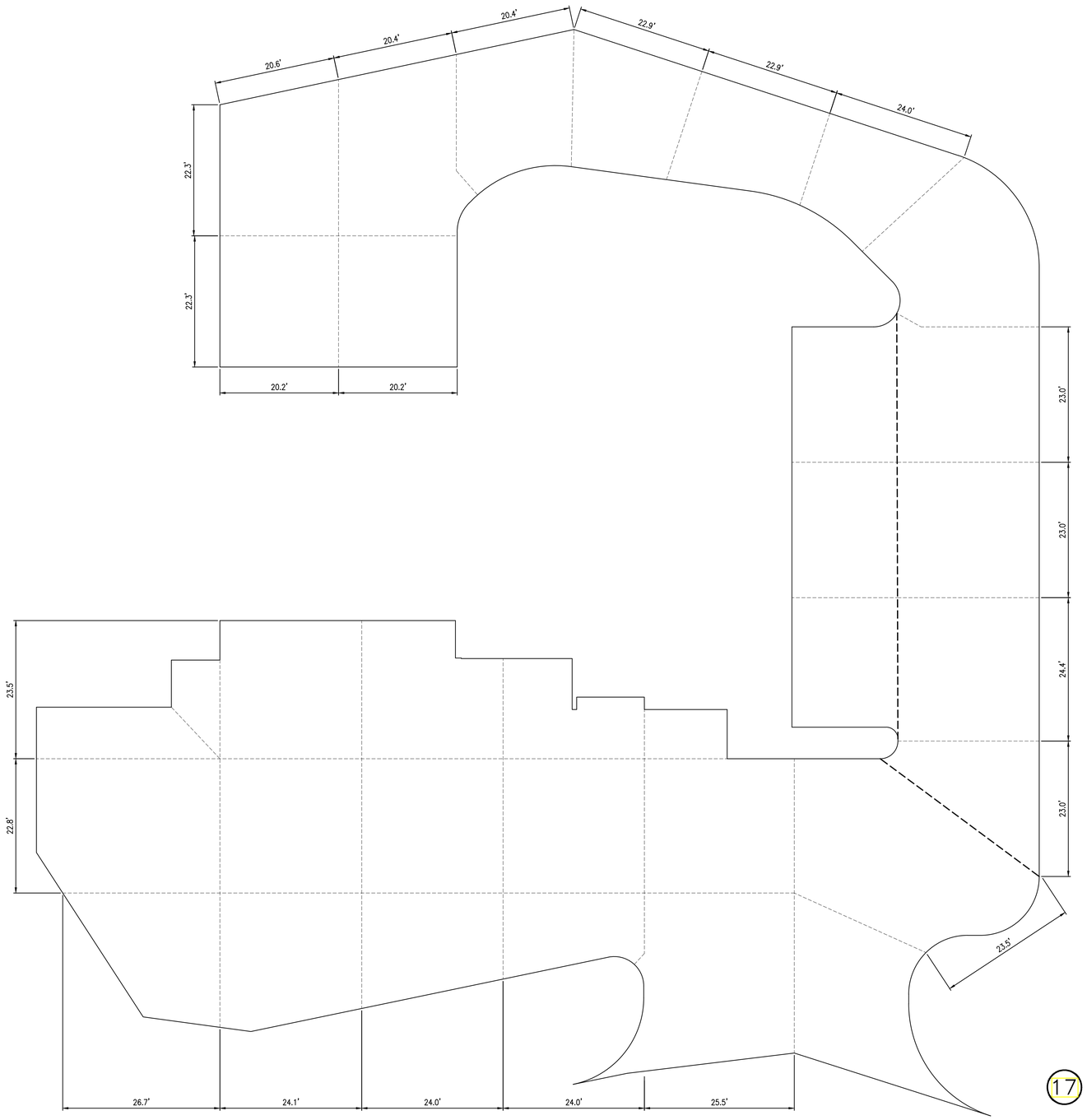
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PROJECT NO.:
CONTRACT NO.:

SHEET NO.:
PAVING, GRADING AND DRAINAGE DETAILS

C011

PROFESSIONAL ENGINEER
DAMIAN CARTWRIGHT
28851-IB
VIRGIN ISLANDS OF THE U.S.A.



JOINT SEALING

1. ALL CONCRETE SURFACES AND JOINTS SHALL BE FLUSHED CLEAN WITH WATER AFTER BOTH INITIAL AND FINAL SAW- CUTS, PRIOR TO SAWCUT SLURRY DRYING.
2. AFTER SECOND SAWCUT, JOINT FACES SHALL BE SAND BLASTED AND AIR-BLOWN.
3. SEAL RESERVOIR SHALL BE FORMED USING SECOND SAWCUT. SHOULDERED BLADE SHALL NOT BE USED WITH INITIAL SAWCUT.
4. INSERT TEMPORARY BACKER ROD AFTER INITIAL SAWCUT TO PREVENT DEBRIS INTRUSION.
5. FOR ALL JOINTS THE BACKER ROD MATERIAL SHALL BE COMPATIBLE WITH THE COLD POURED SEALANT AND SLIGHTLY OVERSIZED TO PREVENT MOVEMENT DURING THE JOINT SEALANT OPERATION.
6. TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED ONLY WHEN APPROVED BY THE ENGINEER.

DOWEL AND TIE BAR NOTES

1. DOWEL OR TIE BAR INSERTERS SHALL NOT BE USED.
2. DRILLING METHOD SHALL MAINTAIN DRILL HOLES PARALLEL TO CONCRETE SURFACE AND NORMAL TO JOINT LINE WITHIN 1/4" ± AT END OF DOWEL BAR. USE GANG DRILL WITH 3 OR MORE DRILLS. DRILL HOLE MAXIMUM DEVIATION SHALL NOT EXCEED 1" HORIZONTAL HOLE DIAMETER TO BE APPROXIMATELY 1/8" – 1/4" LARGER THAN DOWEL. MINIMUM THREE DAYS CURE TIME AND 300 PSI FLEXURAL STRENGTH REQUIRED FOR DRILLING NEW CONCRETE.
3. AFTER DRILLING IS COMPLETE, AND PRIOR TO INSTALLATION OF DOWELS, THOROUGHLY CLEAN HOLES BY FLUSHING. ALLOW TO DRY. AIR BLOW TO REMOVE DRILLING DUST, CONCRETE CHIPS, AND ANY MATERIAL DETRIMENTAL TO DEVELOPING BOND.
4. INSERT EPOXY INTO BACK OF DOWEL HOLE BY INJECTION NOZZLE WITH SUFFICIENT EPOXY PLACED SO SLIGHT AMOUNT FORCED OUT WHEN DOWEL INSERTED AND TAPPED TO CORRECT POSITION. DOWEL SHALL BE TURNED WHEN INSERTED AND EPOXY SHALL BE SOLID AROUND BARS WITH NO VOIDS. INSTALL PLASTIC DOWEL RINGS TO RETAIN EPOXY. SMALL WEDGES MAY BE USED TO SUPPORT DOWEL IN CORRECT ALIGNMENT UNTIL EPOXY HARDENS. SUBMIT PROPOSED EPOXY INFORMATION FOR APPROVAL PRIOR TO STARTING WORK.
5. "T" = THICKNESS OF NEW CONCRETE PAVEMENT
6. "d" = DOWEL OR TIE-BAR DIAMETER

LEGEND

TYPE 1 / TYPE 2 CONTRACTION JOINT

TYPE D DUMMY TRANSVERSE CONTRACTION JOINT

17 CONCRETE PAVEMENT JOINTING PLAN
N.T.S.

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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P.O. BOX 8269
Christiansted, USVI 00823

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5143 Palm Passage,
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St. Thomas, U.S. Virgin Islands 00804-6218
telephone: 340.777.1600
e-mail: jarediandesigngroup@gmail.com
website: www.jarediandesigngroup.com

CLIENT:
V.I. Fire & Emergency Management Services

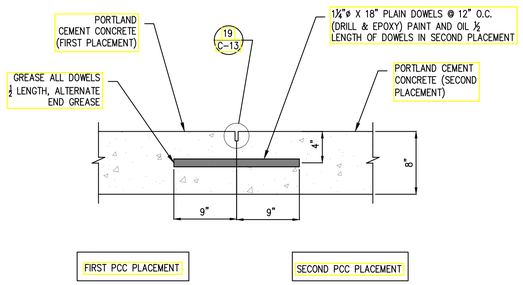
PROJECT ADDRESS:
Parcel Nos. 3C-C-1
Estate Fortuna, Charlotte Amalie
St. Thomas, USVI 00801

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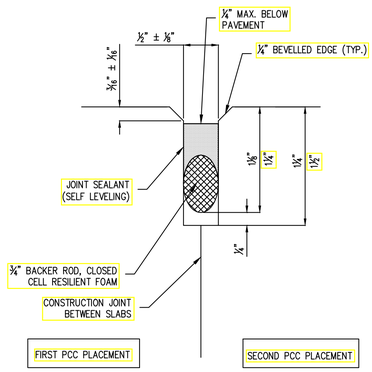
PROJECT NO.:
CONTRACT NO.:

SHEET NO.:
PAVING, GRADING AND DRAINAGE DETAILS
C012

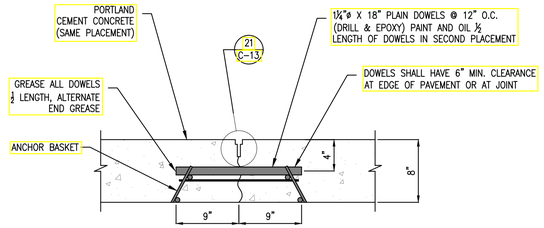
PROFESSIONAL ENGINEER
DAMIAN CARTWRIGHT
28851-IB
ST. THOMAS, V.I.



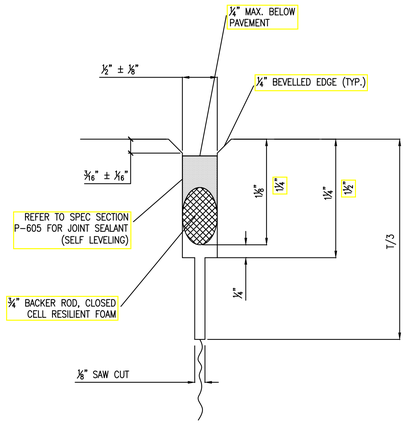
18 TYPE 1 – CONTRACTION JOINT (DOWELED)
N.T.S.



19 TYPE 1 – CONTRACTION JOINT
N.T.S.



20 TYPE 2 – CONTRACTION JOINT (DOWELED)
N.T.S.

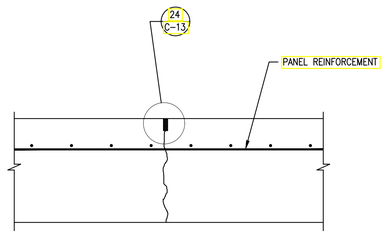


21 TYPE 2 – CONTRACTION JOINT
N.T.S.

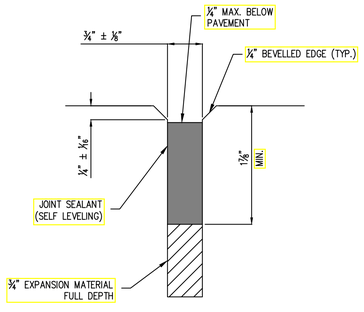
22 TYPICAL DOWEL AND TIE BAR BASKET
N.T.S.

24 INITIAL SAWCUT DETAIL FOR CONTRACTION JOINTS
N.T.S.

26 TYPE "D" CURB
N.T.S.



23 TYPE D – DUMMY TRANSVERSE CONTRACTION JOINT
N.T.S.



25 EXPANSION/ISOLATION JOINT
N.T.S.

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

BUILDTEC
P.O. BOX 8269
Christiansted, USVI 00823

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5143 Palm Passage,
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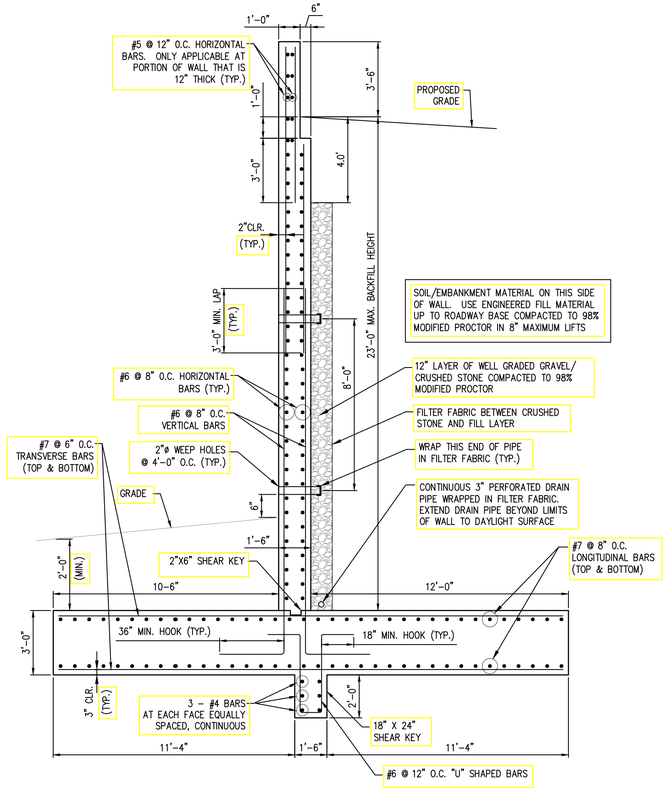
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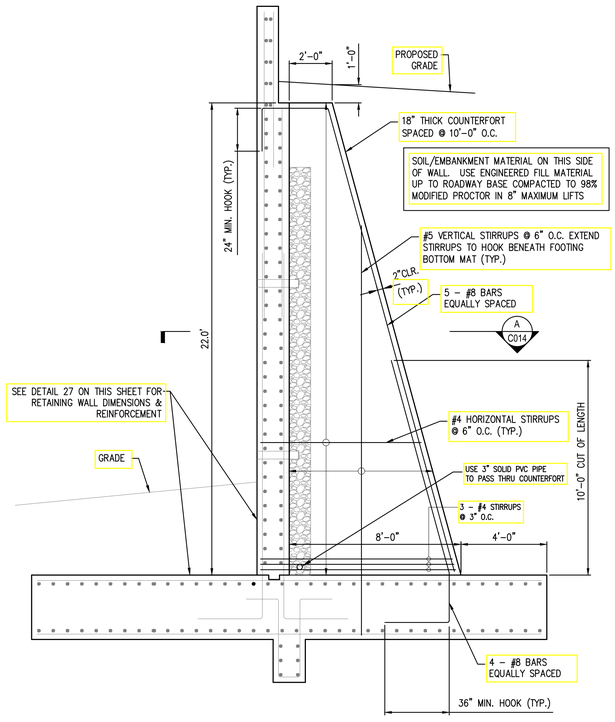
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PAVING, GRADING AND DRAINAGE DETAILS
C013

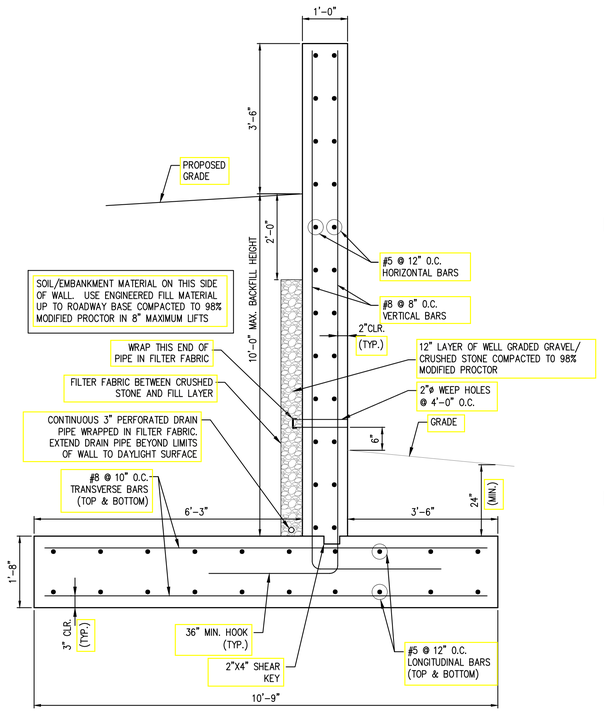




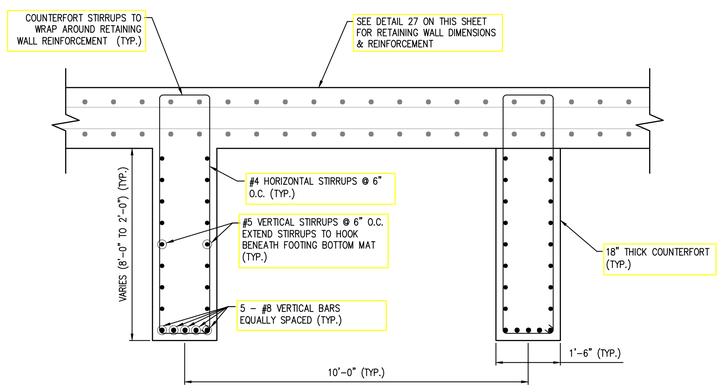
27 RETAINING WALL 1
N.T.S.



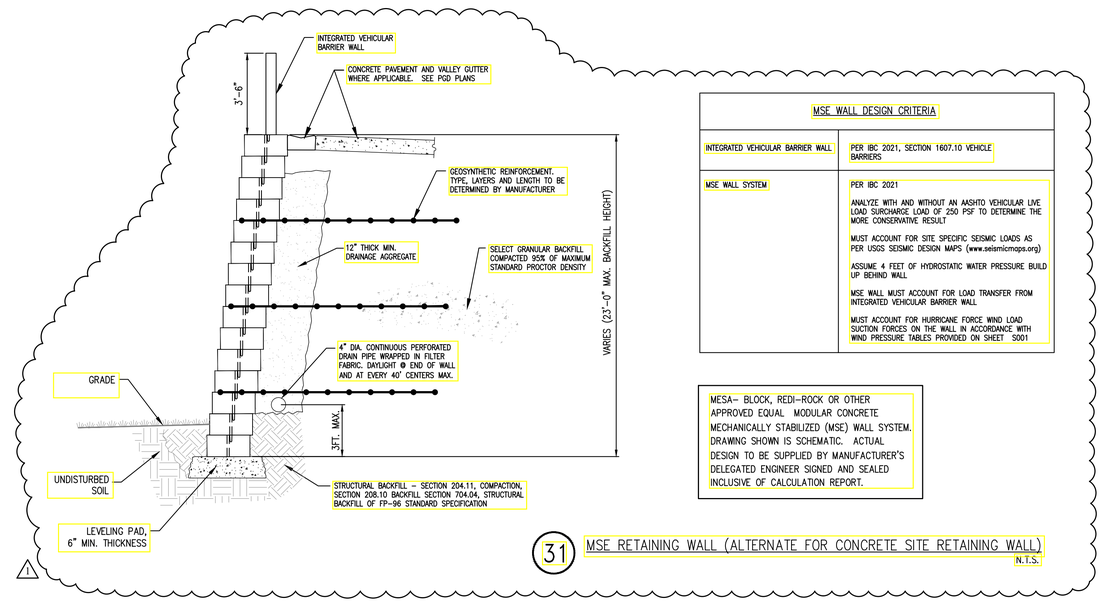
28 RETAINING WALL 1 - AT COUNTERFORT
N.T.S.



30 RETAINING WALL 2
N.T.S.



29 RETAINING WALL 1 - SECTION A @ COUNTERFORT
N.T.S.



MSE WALL DESIGN CRITERIA

INTEGRATED VEHICULAR BARRIER WALL	PER IBC 2021, SECTION 1607.10 VEHICLE BARRIERS
MSE WALL SYSTEM	PER IBC 2021 ANALYZE WITH AND WITHOUT AN AASHTO VEHICULAR LIVE LOAD SURCHARGE LOAD OF 250 PSF TO DETERMINE THE MORE CONSERVATIVE RESULT MUST ACCOUNT FOR SITE SPECIFIC SEISMIC LOADS AS PER USGS SEISMIC DESIGN MAPS (www.seismicmaps.org) ASSUME 4 FEET OF HYDROSTATIC WATER PRESSURE BUILD UP BEHIND WALL MSE WALL MUST ACCOUNT FOR LOAD TRANSFER FROM INTEGRATED VEHICULAR BARRIER WALL MUST ACCOUNT FOR HURRICANE FORCE WIND LOAD SUCTION FORCES ON THE WALL IN ACCORDANCE WITH WIND PRESSURE TABLES PROVIDED ON SHEET S001

MESA- BLOCK, REDI-ROCK OR OTHER APPROVED EQUAL MODULAR CONCRETE MECHANICALLY STABILIZED (MSE) WALL SYSTEM. DRAWING SHOWN IS SCHEMATIC. ACTUAL DESIGN TO BE SUPPLIED BY MANUFACTURER'S DELEGATED ENGINEER SIGNED AND SEALED INCLUSIVE OF CALCULATION REPORT.

31 MSE RETAINING WALL (ALTERNATE FOR CONCRETE SITE RETAINING WALL)
N.T.S.

REVISIONS

NO.	DATE	REMARKS
1	08-22-25	REVISIONS

CONSULTANTS

BUILDTEC
P.O. BOX 8269
Christiansted, USVI 00823

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C014

PROFESSIONAL ENGINEER
DAMIAN CARTWRIGHT
28851-19
VIRGIN ISLANDS

PARCEL No 3C-119

PARCEL No 3C-120

PARCEL No 3C-121

PARCEL No 3C-122

PARCEL No 3C-118

PARCEL No 3C-140

EDGE CONC ROAD

ROCKS

ROW PARCEL No 3C-127

PARCEL No 3C-J

PARCEL No 3C-C-1
1.432 AC

PARCEL No 3C-C-REM

PARCEL No 3B

REM PORTION

PARCEL No 3C

N 74°00'00" E
62.43'

S 45°20'00" E
115.20'

N 48°43'31" W
174.58'

N 59°59'31" W
703.43'

S 00°14'56" W
133.38'

N 78°55'55" W
91.64'

RM 1.27'

RM 1.05'

RM 1.39'

RM 1.68'

RM 1.24'

RM 1.88'

RM 1.33'

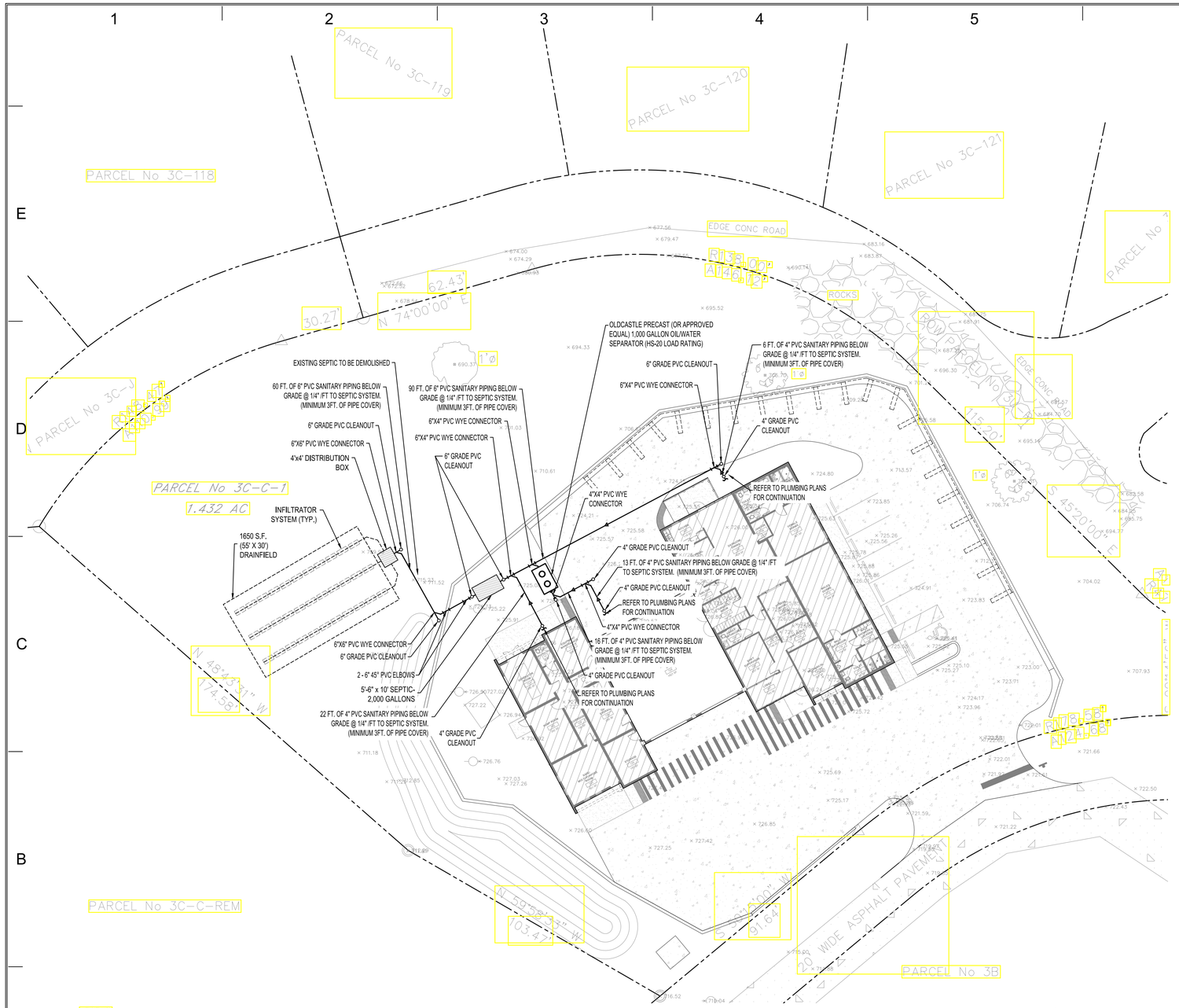
RM 1.20'

RM 1.03'

RM 1.00'

RM 1.00'

RM 1.00



LEGEND

- RIGHT-OF-WAY / PROPERTY LINE
- NEW SANITARY SEWER LATERAL
- NEW TELECOM CONDUITS (REFER TO ELECTRICAL PLANS)
- NEW ELECTRICAL CONDUITS (REFER TO ELECTRICAL PLANS)
- EXISTING OVERHEAD ELECTRIC
- NEW OVERHEAD ELECTRIC

NOTES:

1. COORDINATE THIS PLAN SHEET WITH THE ARCHITECTURAL, STRUCTURAL AND M.E.P. DRAWINGS. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORKS SHOWN ON THESE PLANS
2. COORDINATE THIS SHEET WITH DEMOLITION PLAN SHEET C005, SITE & GEOMETRY PLAN SHEET C006, & PAVING, GRADING & DRAINAGE PLAN SHEET C007
3. COORDINATE THIS PLAN SHEET WITH THE ELECTRICAL / TELECOM DRAWINGS & SPECIFICATIONS. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORKS SHOWN ON THESE PLANS

N

GRAPHIC SCALE IN FEET
0 10 20 40

GENERAL NOTES:

1. ALL PAVED SURFACES, INCLUDING DRIVEWAYS CROSSED BY THE PROPOSED UTILITIES SHALL BE SAW CUT TO PROVIDE A CLEAN TRUE EDGE FOR PAVEMENT REPLACEMENT.
2. THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION ACTIVITIES TO THE AREA WITHIN THE PROPERTY AND CONSTRUCTION LIMITS UNLESS OTHERWISE APPROVED BY THE OWNER.
3. ROOF DRAINS, FOUNDATION DRAINS, SUMP PUMP DRAINS AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER ARE PROHIBITED. NO BUILDING SHALL BE CONNECTED TO A SEWER LATERAL UNTIL THE BUILDING IS UNDER ROOF.
4. ALL MATERIAL, CONSTRUCTION METHODS AND TESTING PROCEDURES SHALL BE IN CONFORMANCE WITH THE WRITTEN SPECIFICATIONS OF THE V.I. WATER & POWER AUTHORITY (VIWAPA) FOR ALL WATER LINE WORK, AND THE V.I. WASTE MANAGEMENT AUTHORITY FOR ALL SANITARY SEWER LINE WORK (VIWMA).
5. THE SOIL TYPES IN THE AREAS OF THE PROPOSED SEWER LINES WERE VISUALLY OBSERVED FOR THE PRESENCE OF CORROSIVE SOILS. THERE WERE NO CORROSIVE SOILS DETECTED. SHOULD IRON PIPES BE PROPOSED IN AN AREA AND CORROSIVE SOILS ENCOUNTERED, THE PIPE SHALL BE PROTECTED BY AN 8 MIL THICK POLYETHYLENE ENCASEMENT MEETING THE REQUIREMENTS OF ANSI A21.5.
6. ALL WATER AND SEWAGE FACILITIES DESIGNED HEREIN SHALL CONFORM TO THE MATERIALS, SPECIFICATIONS, CONSTRUCTION METHODS AND STANDARD DETAILS SPECIFIED BY VIWAPA AND VIWMA, RESPECTIVELY. IN CASE OF CONFLICTS WITH THE PROJECT'S WRITTEN SPECIFICATIONS OR STANDARD DETAILS, THE MORE STRINGENT SHALL APPLY. THE VIWAPA AND VIWMA SHALL MAKE THE FINAL DECISION IN EACH CASE.
7. ALL SERVICES HAVE BEEN DESIGNED AND DRAWN IN ACCORDANCE WITH BASE SITE LAYOUT PLANS AND LAND SURVEY DRAWINGS PROVIDED BY THE OWNER'S REPRESENTATIVE. THE ENGINEER ACCEPTS NO RESPONSIBILITY FOR FIELD ERRORS RESULTING FROM INACCURACIES IN OWNER-PROVIDED SITE PLANS.
8. CONTRACTOR SHALL BEAR RESPONSIBILITY FOR ACCURATE LOCATION OF WATER AND SEWER LINES AND APPURTENANCES. CONTRACTOR SHALL MAINTAIN ACCURATE RECORDS OF LOCATIONS OF ALL SEWER AND WATER DISTRIBUTION LINES, APPURTENANCES, HYDRANTS, CLEANOUTS, JUNCTIONS AND BRANCHES.
9. ELECTRICAL CONDUIT(S) TO CROSS BELOW SANITARY SEWER LATERAL WITH MINIMUM 12" CLEAR SEPARATION.
10. ELECTRICAL CONDUIT(S) TO CROSS BELOW ANY WATER LINES WITH MINIMUM 12" CLEAR SEPARATION.
11. ELECTRICAL CONDUIT(S) TO CROSS ABOVE OR BELOW STORM SEWER LINE WITH MINIMUM 12" CLEAR SEPARATION.

SANITARY SEWER SYSTEM:

1. BUILDING SEWERS SHALL CONNECT TO MAIN GRAVITY SEWER LINES ONLY. BUILDING LINE CONNECTIONS DIRECTLY TO MANHOLES ARE NOT PERMITTED.
2. CONTRACTOR IS RESPONSIBLE FOR LOCATION, REMOVAL AND OR COORDINATION OF EXISTING UTILITIES. THE ENGINEER OF RECORD SHALL BE APPRAISED OF ANY CONFLICTS BETWEEN EXISTING UTILITIES AND THE NEW DESIGN PRIOR TO ANY SITE CORRECTION OF NEW DESIGN BY THE CONTRACTOR.
3. CONTRACTOR SHALL PREPARE AS-BUILT DRAWINGS. FINAL INSPECTION AND APPROVALS WILL NOT BE GRANTED WITHOUT THE SAME.
4. ALL CONSTRUCTION WORKS SHALL BE CARRIED OUT BY COMPETENT CONTRACTORS EXPERIENCED IN THE CONSTRUCTION OF SANITARY SEWAGE WORKS AND ALL MACHINERY INSTALLATION SHALL BE SUPERVISED, TESTED AND/OR CERTIFIED BY THE MANUFACTURER'S REPRESENTATIVE.
5. ALL WORKS SHALL BE OPEN TO INSPECTION BY THE OWNER'S REPRESENTATIVE THROUGHOUT CONSTRUCTION.
6. ALL GRAVITY SANITARY SEWER LINES SHALL BE ASTM D3034 PVC PIPE WITH STANDARD DIMENSION RATIO (SDR) OF 35. SEWER PIPES AND FITTINGS SHALL HAVE BONDED, RESILIENT JOINTS WHICH SHALL RETAIN WATER TIGHTNESS BY COMPRESSION OF THE GASKET MATERIAL AROUND THE ENTIRE PERIPHERY OF THE PIPE.
7. LEAKAGE FOR NEW CONSTRUCTION, OR SYSTEMS THAT HAVE NEVER BEEN COMMISIONED, SHALL BE ZERO. LEAKAGE INWARD OR OUTWARD FROM EXISTING SEWERS SHALL NOT EXCEED 300 GALLONS PER INCH DIAMETER PER MILE PER DAY.
8. THE MINIMUM ALLOWABLE SIZE OF SEWERS OTHER THAN BUILDING CONNECTIONS SHALL BE EIGHT (8) INCHES DIAMETER.
9. THE FOLLOWING MINIMUM GRADES SHALL BE PROVIDED :

4" & 6" DIAMETER SEWER SERVICE LATERALS	2.0%
8" DIAMETER SEWERS	0.40%
10" DIAMETER SEWERS	0.28%
12" DIAMETER SEWERS	0.22%
15" DIAMETER SEWERS	0.15%
18" DIAMETER SEWERS	0.12%
21" DIAMETER SEWERS	0.10%
24" DIAMETER SEWERS	0.08%

10. SEWERS SHALL BE LAID WITH UNIFORM SLOPES.

REVISIONS

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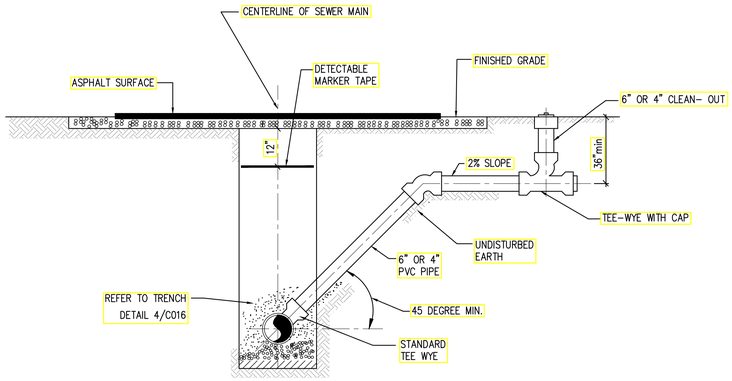
DATE: August, 2024
DRAWN BY: DC
CHECKED BY: DC
APPROVED BY: DC

PROJECT NO.:
CONTRACT NO.:

SHEET NO.: UTILITY PLAN, POTABLE WATER & SANITARY SEWER NOTES

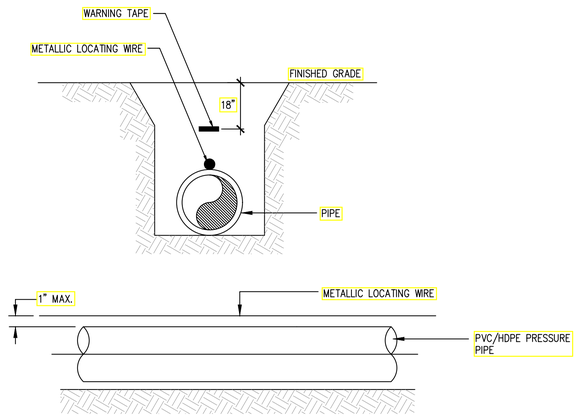
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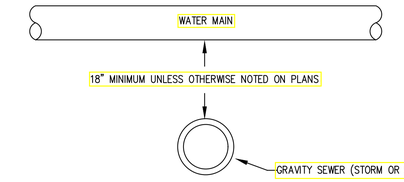
THROUGHLY COMPACT PEA GRAVEL AGAINST UNDISTURBED EARTH,GRAVEL OR CONCRETE ENCASED TO PREVENT MOVEMENT.

1 SANITARY SEWER LATERAL
NOT TO SCALE



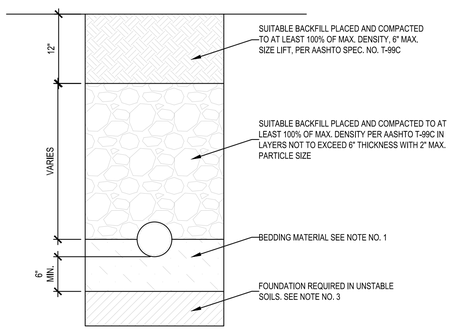
NOTES:
1. PVC/HDPE PRESSURE PIPE SHALL REQUIRE INSULATED METALLIC LOCATING WIRE (14 GAUGE COPPER) CAPABLE OF DETECTION BY A CABLE LOCATOR AND SHALL BE TAPED TO CENTERLINE OF THE PIPE.
2. LOCATING WIRE SHALL TERMINATE AT THE TOP OF EACH VALVE BOX AND BE CAPABLE OF EXTENDING 3" ABOVE TOP OF BOX IN SUCH A MANNER SO AS NOT TO INTERFERE WITH VALVE OPERATION.
3. USE DUCT TAPE OR PLASTIC TIES AS NECESSARY TO HOLD WIRE DIRECTLY ON THE TOP OF THE PIPE.
4. EXTEND METALLIC LOCATING WIRE ALONG STUBBED OUT SERVICE CONNECTIONS
5. WARNING/MARKING TAPE SHALL BE DIRECTLY ABOVE ALL PRESSURE PIPE. TAPE SHALL HAVE 18" COVER

2 PIPE LOCATING WIRE
NOT TO SCALE



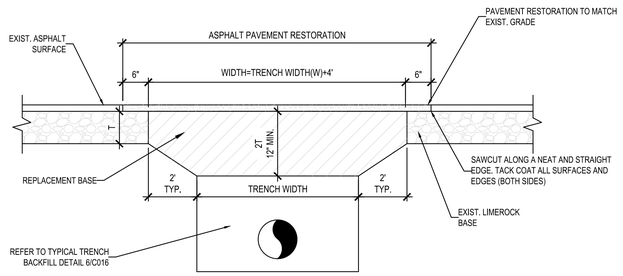
NOTES:
1. A VERTICAL SEPERATION DISTANCE OF A MINIMUM OF 18" MUST BE MAINTAINED.
2. IF MINIMUM VERTICAL SEPERATION IS NOT POSSIBLE THEN THE SEWER MAIN MUST BE ENCASED FOR A DISTANCE 20'-0" CENTERED ON THE POINT OF CROSSING AND SEWER MAIN MUST BE OF WATER QUALITY (i.e. DR. 18 AWWA C900).

3 WATERMAIN CROSSING
NOT TO SCALE



NOTES:
1. UNLESS OTHERWISE SPECIFIED, BEDDING MATERIAL SHALL CONSIST OF SELECT BACKFILL MATERIAL 2" MAXIMUM PARTICLE SIZE, COMPACTED TO AT LEAST 100% OF MAX. DENSITY, 6" LIFTS, PER AASHTO SPEC. NO. T-99C
2. WHERE REQUIRED, SHEETING AND SHORING SHALL BE IN ACCORDANCE WITH OSHA REQUIREMENTS.
3. WHERE UNSTABLE SOILS ARE ENCOUNTERED, INCLUDING PEAT, MUCK OR OTHER ORGANIC SOILS, ELASTIC SILT AND CLAYS, A FOUNDATION IS REQUIRED AS DETERMINED BY THE ENGINEER.

4 TYPICAL TRENCH BACKFILL
NOT TO SCALE



GENERAL NOTES:
1. REPLACED BASE MATERIAL OVER DITCH SHALL BE TWICE THE THICKNESS OF THE ORIGINAL BASE. BUT NOT LESS THAN 12".
2. BASE MATERIAL SHALL BE PLACED IN 6 INCH MAXIMUM LAYERS AND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 98% OF MAXIMUM DENSITY, PER AASHTO T-180. BASE MATERIAL SHALL HAVE A MINIMUM LBR OF 100.
3. ASPHALTIC CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED.
4. SURFACE TREATED PAVEMENT JOINTS SHALL BE LAPPED AND FEATHERED. PAVEMENT MATERIAL SHALL BE FDOT TYPE SP-9.5 (FINE MIX) ASPHALTIC CONCRETE STRUCTURAL COURSE (1" THICK), MATCH EXISTING GRADES AT LIMIT OF SAWCUT.
5. UPON COMPLETION OF TRENCHING AND TRENCH/PAVEMENT RESTORATION FOR THE ENTIRE PROJECT, RESURFACE ENTIRE ROADWAY WIDTH WITH FDOT TYPE SP-9.5 (FINE MIX) ASPHALTIC CONCRETE SURFACE COURSE OVERLAY (1" MINIMUM THICKNESS).
6. BID PRICES FOR PIPE AND/OR FRENCH DRAIN SHALL INCLUDE PAVEMENT RESTORATION TO MATCH EXISTING GRADES. CONTRACTOR SHALL NOT LEAVE MORE THAN 1,000-FEET OF EXPOSED LIMEROCK BASE AT ANY TIME DURING THE TRENCH/PAVEMENT RESTORATION PROCESS. ONLY THE FDOT TYPE SP-9.5 (FINE MIX) ASPHALTIC CONCRETE SURFACE COURSE OVERLAY WILL BE PAID SEPARATELY.
7. WHEN TRENCHING OUTSIDE THE PAVEMENT AREA, ASPHALT AND BASE MATERIAL REFERENCED IN GENERAL NOTES 1-5 ARE NOT REQUIRED. RESTORE OR REPLACE ALL PUBLIC OR PRIVATE PROPERTY TO A CONDITION AT LEAST EQUAL TO THAT EXISTING IMMEDIATELY PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL IMPACTED AREAS SHALL BE COMPACTED TO 95% DENSITY IN 6-INCH MAXIMUM LIFTS.
8. CONTRACTOR SHALL REFER TO GEOTECHNICAL REPORT FOR ADDITIONAL SOILS INFORMATION TO UNDERSTAND EXISTING CONDITIONS.

5 PAVEMENT RESTORATION
NOT TO SCALE

REVISIONS

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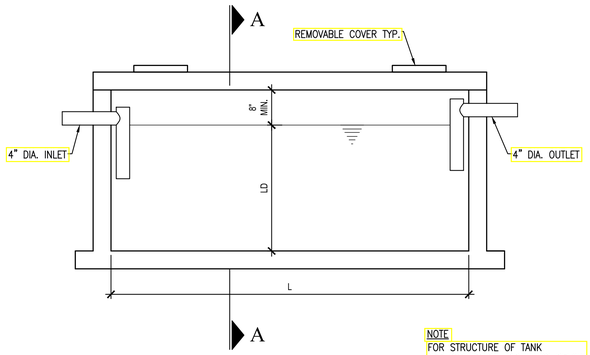
PROJECT ADDRESS:
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Estate Fortuna, Charlotte Amalie
St. Thomas, USVI 00801

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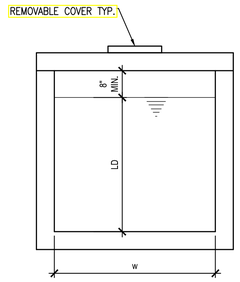
SHEET NO.:
UTILITY DETAILS
C017

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VIRGIN ISLANDS

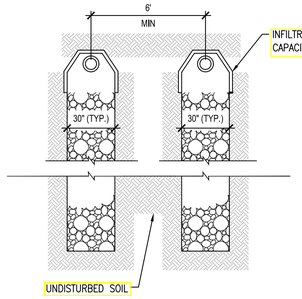


NOTE
FOR STRUCTURE OF TANK
SEE STRUCTURAL DRAWINGS BELOW

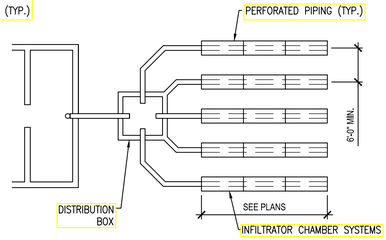
6 SEPTIC TANK DETAILS
NOT TO SCALE



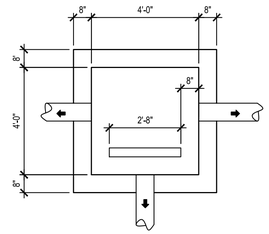
7 SECTION A-A
NOT TO SCALE



8 DRAIN FIELD SECTION
NOT TO SCALE



9 DRAIN FIELD PLAN
NOT TO SCALE

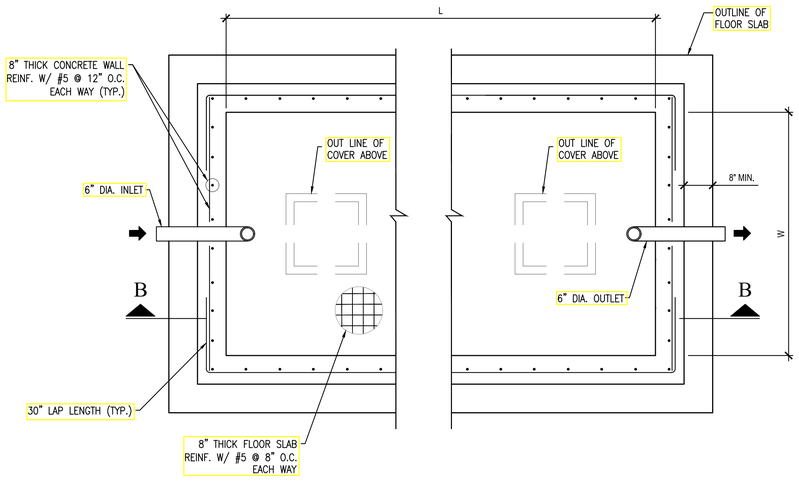


SUBMIT SIGNED AND SEALED
SHOP DRAWINGS FOR APPROVAL

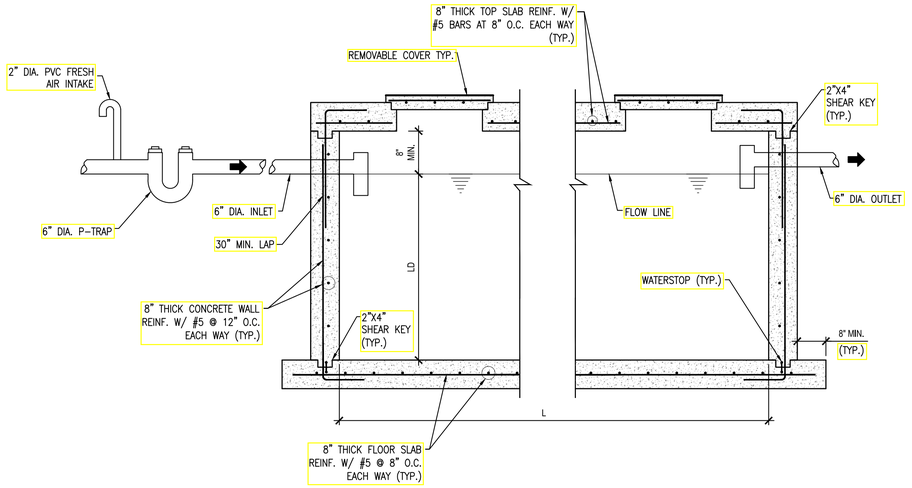
10 DISTRIBUTION BOX PLAN
NOT TO SCALE

SEPTIC TANK SCHEDULE				
NUMBER OF BEDROOMS	CAPACITY (GALLONS)	WIDTH "W"	LENGHT "L"	LIQUID DEPTH "LD"
2 OR LESS	1,000	4'–0"	7'–0"	5'–0"
3	1,200	4'–0"	8'–0"	5'–0"
4	1,500	4'–6"	9'–0"	5'–0"
5	2,000	5'–6"	10'–0"	5'–0"
6	2,500	7'–0"	10'–0"	5'–0"

NOTES:
1. Extra bedroom 150 gallons each. Extra dwelling units over 10,250 gallon each Extra fixture unit over 10,026 gals. per fixture unit. The normal desired depth below the surface for a septic tank is between 12" to 18". It is extremely important that any septic tank that is located below 3'–0" in depth shall have sufficient structural strength to withstand the loads superimposed above.
2. Submit signed & sealed shop drawings for approval.



11 SEPTIC TANK PLAN
NOT TO SCALE



12 SECTION B-B - THRU SEPTIC TANK
NOT TO SCALE

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PROFESSIONAL ENGINEER
DAMIAN CARTWRIGHT
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U.S. VIRGIN ISLANDS

SEPTIC SYSTEM SIZING

Table I - Flow Projection Based Upon Gallons Per Person Per Day:

Airports (per passenger)	5
Apartments–multiple family (per resident)	50
Bathhouses and swimming pools	10
Camps:	
Campground with central comfort stations	35
With flush toilets, no showers	25
Day camps (no meals served)	15
Resort camps (night and day) with limited plumbing	50
Luxury camps	100
Cottages and small dwellings with seasonal occupancy	50
Country clubs (per resident member)	100
Country clubs (per non-resident member present)	25
Dwellings:	
Boarding houses	50
additional for non-resident boarders	10
Luxury residences and estates	150
Multiple family dwellings (apartments)	50
Rooming houses	40
Single family dwellings	75-100
Factories (gallons per person, per shift, exclusive of industrial wastes)	35
Hospitals (per bed space)	350
Hotels with private baths (2 persons per room)	60
Hotels without private baths	50
Institutions other than hospitals (per bed space)	125
Laundries, self-service (gallons per wash, i.e., per customer)	50
Mobile home parks (per space)	250
Motels with bath, toilet and kitchen wastes (per bed space)	50
Motels (per bed space)	40
Picnic Parks (toilet wastes only) (per picnicker)	5
Picnic Parks with bathhouses, showers and flush toilets	10
Restaurants (per seat)	25
Restaurants (toilet and kitchen wastes per patron)	10
Restaurants (kitchen wastes per meal served)	3
Restaurants, additional for bars and cocktail lounges	2
Schools:	
Boarding	100
Day, without gyms, cafeterias or showers	15
Day, with gyms, cafeterias and showers	25
Day, with cafeterias, but without gyms or showers	20
Service Stations (per vehicle served)	10

4

Per Table I Above: Use 125 gpd per dormitory bed space:

# of beds = **6**

Total gallons per day (gpd)

125 gpd (per bed) **750** **gpd**

Septic will be sized for: **1125** **gallons per day**
(Factor of safety = 1.5)

TABLE II
SEPTIC TANK AND PUMP TANK CAPACITY

AVERAGE SEWAGE FLOW GALLONS/DAY	SEPTIC TANK MINIMUM EFFECTIVE CAPACITY GALLONS	PUMP TANK MINIMUM TOTAL CAPACITY GALLONS	
		Residential	Commercial
0-250	900	150	225
251-300	900	225	375
301-400	1000	300	450
401-500	1200	375	600
501-600	1350	450	600
601-700	1500	525	750
701-800	1650	600	750
801-1000	1950	750	1050
1001-1250	2200	900	1200
1251-1750	2700	1350	1900
1751-2500	3200	1650	2700
2501-3500	3700	1950	3000
3501-4500	4500	2250	3000
4501-5000	5000	2700	3000
5001-6000	5500	2700	3000
6001-7000	6000	3000	3000
7001-8000	6500	3000	3000

Since the design flow is between 1001 - 1250 gpd, per Table II above, ***the minimum effective capacity gallons for the septic tank is*** **2200**:

A septic tank of 2500 gallons is proposed.

TABLE III
For Sizing of Drainfields

Sewage flows are 200 gallons per day or higher. When estimated sewage flows are less than 200 gallons per day, system size shall be based on a minimum of 200 gallons per day.

(Column A) U.S. DEPARTMENT OF AGRICULTURE SOIL TEXTURE CLASSIFICATION	*(Column B)* SOIL TEXTURE LIMITATION (PERCOLATION RATE)	*(Column C)* MAXIMUM SEWAGE LOADING RATE TO ABSORPTION SURFACE IN GALLONS PER SQUARE FOOT PER DAY
Sand; Coarse Sand not associated with a seasonal water table of less than 48 inches; and Loamy Coarse Sand	Slightly limited (Less than 2 Min/inch)	0.80
Loamy Sand; Sandy Loam; Coarse Sandy Loam; and Fine Sand	Slightly limited (2-4 min/inch)	0.80
Loam; Fine Sandy Loam; Silt Loam; Very Fine Sand; Very Fine Sandy Loam; Loamy Fine Sand; Loamy Very Fine Sand; and Sandy Clay Loam	Moderately limited (5-10 min/inch)	0.65
Clay Loam; Silty Clay Loam; Sandy Clay; Silty Clay; and Silt	Moderately limited (Greater than 15 Min/inch but not exceeding 30 min/inch)	0.35
Clay; Organic Soils; Hardpan; and Bedrock	Severely limited (Greater than 30 Min/inch)	Unsatisfactory for standard subsurface System
Coarse Sand with an estimated wet season High water table within 48 inches of the bottom of the proposed drainfield; Gravel or Fractured Rock or Oolitic Limestone	Severely limited (Less than 1 Min/inch and a Water table less than 4 feet below The drainfield)	Unsatisfactory for standard subsurface System

Based on Table III above for observed onsite soil conditions consisting of coarse to fine sand, a slightly limited percolation rate (2-4 min/in) with a loading factor of 0.80 will be used:

315/0.80 = **1,406** **S.F.**

A trench drain field of 1650 s.f. will be used with a gravel base coarse of 12" and the use of infiltrators. (55' x 30' drainfield)

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STRUCTURAL NOTES

GENERAL:
STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH JOB SPECIFICATIONS AND ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND SITE DRAWINGS. CONSULT THESE DRAWINGS FOR DEPRESSIONS, AND OTHER DETAILS NOT SHOWN ON STRUCTURAL DRAWINGS.

DIMENSIONS AND CONDITIONS MUST BE VERIFIED IN THE FIELD. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK.

THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE BUILDING IS COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCE TO INSURE SAFETY OF THE BUILDING AND ITS COMPONENTS DURING ERECTION. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS OR TIEDOWNS.

CONTRACTOR PROPOSED CHANGES AND SUBSTITUTIONS:
PROPOSED CHANGES OR SUBSTITUTIONS TO STRUCTURAL DETAILS OR PLANS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD (EOR) FOR REVIEW AND APPROVAL. SUBMITTALS SHALL CONTAIN FULL DOCUMENTATION OF CHANGES OR SUBSTITUTIONS.

DESIGN LOADS:
THE STRUCTURAL SYSTEM FOR THIS BUILDING HAS BEEN DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE(IBC) 2021
FOLLOWING SUPERIMPOSED LOADINGS HAVE BEEN UTILIZED:

ROOF LIVE LOAD: 20 PSF (50 PSF FOR SAFE ROOM)
FLOOR LIVE LOAD: 50 PSF
CISTERN TOP SLAB LIVE LOAD: 100 PSF
APPARATUS BAY LIVE LOAD: 250 PSF (HEAVY STORAGE)
WIND: ASCE 7-16
- 175 MPH REGION (207 MPH FOR SAFE ROOM)
- EXPOSURE 'C' (EXPOSURE 'D' FOR SAFE ROOM)
- CATEGORY IV
- IMPORTANCE FACTOR, I = 1.15

EARTHQUAKE LOAD IS BASED ON THE FOLLOWING CRITERIA:

Sds	– 0.823 (PER USGS SEISMIC DATA)
Sd1	– 0.535 (PER USGS SEISMIC DATA)
SITE CLASS	– D (PER USGS SEISMIC DATA)
OCCUPANCY CATEGORY	– IV
SEISMIC DESIGN CATEGORY	– D
RESPONSE MODIFICATION COEF., 'R'	– 3.5

SHOP DRAWING REVIEW:
SHOP DRAWINGS WILL BE REVIEWED FOR GENERAL COMPLIANCE WITH THE DESIGN INTENT OF THE CONTRACT DOCUMENTS ONLY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY COMPLIANCE WITH THE CONTRACT DOCUMENTS AS TO QUANTITY, LENGTH, ELEVATIONS, DIMENSIONS, ETC.

SHOP DRAWING SUBMITTALS SHALL INCLUDE ONE GOOD QUALITY REPRODUCIBLE AND THREE SETS OF BLUEPRINTS. ONE SET OF PRINTS WILL BE RETAINED BY THE ENGINEER, ONE BY THE LOCAL BUILDING DEPARTMENT (WHERE REQUIRED) AND THE CONTRACTOR SHALL MAKE PRINTS FROM THE REPRODUCIBLES AS REQUIRED FOR DISTRIBUTION. ENGINEER'S REVIEW STAMP WILL BE PROVIDED TO CONTRACTOR IN ELECTRONIC FORMAT AND SHALL BE APPLIED TO ALL DRAWINGS PRIOR TO SUBMITTAL.

THE CONTRACT DOCUMENTS WILL GOVERN OVER THE SHOP DRAWINGS UNLESS OTHERWISE SPECIFIED IN WRITING BY THE ENGINEER.

CHANGES AND ADDITIONS MADE ON RE-SUBMITTALS SHALL BE CLEARLY FLAGGED AND NOTED. THE PURPOSE OF THE RE-SUBMITTALS SHALL BE CLEARLY NOTED ON THE LETTER OF TRANSMITTAL. ARCHITECT/ENGINEER REVIEW WILL BE LIMITED TO THOSE ITEMS CAUSING THE RE-SUBMITTAL.

SHOP DRAWING SUBMITTALS ARE REQUIRED FOR ALL FRAMING SHOWN ON THESE DRAWINGS INCLUDING, BUT NOT LIMITED TO: CONCRETE MIXES, CONCRETE AND MASONRY REINFORCING, STRUCTURAL STEEL AND CONNECTIONS, STEEL DECK, LIGHT GAGE FRAMING, WOOD ROOF TRUSS/RAFTER FRAMING

FOUNDATIONS:
FOUNDATION DESIGN IS BASED ON AN ASSUMED SOIL BEARING PRESSURE OF 3,000 PSF.

FORMWORK AND SHORING:
NO STRUCTURAL CONCRETE SHALL BE STRIPPED UNTIL IT HAS REACHED AT LEAST TWO THIRDS OF THE 28 DAY DESIGN STRENGTH. DESIGN, ERECTION AND REMOVAL OF ALL FORMWORK, SHORES AND RESHORES SHALL MEET REQUIREMENTS SET FORTH IN ACI STANDARDS 347 AND 301.

REINFORCING STEEL:
SHALL BE ASTM A615 GRADE 60 DEFORMED BARS, FREE FROM OIL, SCALE AND RUST AND PLACED IN ACCORDANCE WITH THE TYPICAL BENDING DIAGRAM AND PLACING DETAILS OF ACI STANDARDS AND SPECIFICATIONS. SECURE APPROVAL OF SHOP DRAWINGS PRIOR TO COMMENCING FABRICATION.

AT CORNERS OF CONCRETE WALLS, BEAMS AND CONTINUOUS WALL FOOTINGS, PROVIDE MATCHING HORIZONTAL BARS X 5'-0" BENT BAR FOR EACH HORIZONTAL BAR SCHEDULED AT EACH FACE.

WHERE COLUMNS ARE AN INTEGRAL PART OF CONCRETE WALLS, WALL REINFORCEMENT SHALL BE CONTINUOUS THRU THE COLUMNS.

ALL HOOKS SHOWN IN REINFORCEMENT SHALL BE ACI RECOMMENDED HOOKS UNLESS OTHERWISE NOTED.

FOR BALCONIES, SLABS AND WALKWAYS EXPOSED TO WEATHER ALL REINFORCING STEEL (TOP AND BOTTOM) AS WELL AS SPACERS AND OTHER DEVICES FOR SPACING, SUPPORTING AND FASTENING REINFORCING SHALL BE GALVANIZED CONFORMING TO ASTM A767. BOLSTERS AND CHAIRS TO BE PLASTIC. CONCRETE PLACED IN THESE AREAS TO HAVE .40 W/C RATIO MAXIMUM AND CONTAIN 2.5 GALLONS OF CALCIUM NITRATE PER CUBIC YARD. REBAR COVER TO BE 1.5" MINIMUM.

ALL DIMENSIONS SHOWING THE LOCATION OF REINFORCING STEEL NOT NOTED AS "CLEAR" OR "CLR." ARE TO CENTER OF STEEL. CLEAR COVER FOR NON-PRESTRESSED CONCRETE REINFORCING SHALL BE AS NOTED BELOW, U.N.O. ON PLANS OR DETAILS.

EXPOSURE CONDITION:	COVER:
CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	3"
EXPOSED TO EARTH OR WEATHER (INCLUDES SLABS ON GRADE)	
NO. 5 AND SMALLER	1-1/2"
NO. 6 AND LARGER	2"
NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	
STRUCTURAL SLABS, WALLS, JOISTS NO. 11 AND SMALLER	3/4"
BEAMS, COLUMNS (PRIMARY REINFORCEMENT, TIES, STIRRUPS, SPIRALS)	1 1/2"

WELDED WIRE FABRIC:
TO CONFORM TO ASTM A 185, FREE FROM OIL, SCALE AND RUST AND PLACED IN ACCORDANCE WITH THE TYPICAL PLACING DETAILS OF ACI STANDARDS AND SPECIFICATIONS. MINIMUM LAP SHALL BE ONE SPACE PLUS TWO INCHES. USE OF FLAT MANUFACTURED SHEETS IS RECOMMENDED.

CONCRETE:
SHALL BE PER AN APPROVED MIX DESIGN PROPORTIONED TO ACHIEVE A STRENGTH AT 28 DAYS AS LISTED BELOW WITH A PLASTIC AND WORKABLE MIX:

3000 PSI FOR FOUNDATIONS AND SLABS ON GRADE.
4000 PSI FOR STRUCTURAL BEAMS, STRUCTURAL COLUMNS, TIE-BEAMS, AND TIE COLUMNS AS INDICATED.
5000 PSI FOR CISTERN TOP SLAB.

CONCRETE SHALL BE PLACED AND CURED ACCORDING TO ACI STANDARDS AND SPECIFICATIONS.

SUBMIT PROPOSED MIX DESIGN WITH RECENT FIELD CYLINDER OR LAB TESTS FOR REVIEW PRIOR TO USE. MIX SHALL BE UNIQUELY IDENTIFIED BY MIX NUMBER OR OTHER POSITIVE IDENTIFICATION. MIX SHALL MEET THE REQUIREMENTS OF ASTM C33 FOR COARSE AGGREGATE. CONCRETE SHALL COMPLY WITH THE REQUIREMENTS OF ASTM STANDARD C94 FOR MEASURING, MIXING, TRANSPORTING, ETC. CONCRETE TICKETS SHALL BE TIME STAMPED WHEN CONCRETE IS BATCHED. THE MAXIMUM TIME ALLOWED FROM THE TIME THE MIXING WATER IS ADDED UNTIL IT IS DEPOSITED IN ITS FINAL POSITION SHALL NOT EXCEED ONE AND ONE HALF (1 1/2) HOURS. IF FOR ANY REASON THERE IS A LONGER DELAY THAN THAT STATED ABOVE, THE CONCRETE SHALL BE DISCARDED. SLABS SHALL BE CURED USING A DISSIPATING CURING COMPOUND MEETING ASTM STANDARD C309 TYPE 1-D AND SHALL HAVE A FUGITIVE DYE. THE COMPOUND SHALL BE PLACED AS SOON AS THE FINISHING IS COMPLETED OR AS SOON AS THE WATER HAS LEFT THE UNFINISHED CONCRETE. SCUFFED OR BROKEN AREAS IN THE CURING MEMBRANE SHALL BE RECOATED DAILY. CALCIUM CHLORIDES SHALL NOT BE UTILIZED; OTHER ADMIXTURES MAY BE USED ONLY WITH THE APPROVAL OF THE ENGINEER.

CONCRETE MIX DESIGNS SHALL INCLUDE A WRITTEN DESCRIPTION INDICATING WHERE EACH PARTICULAR MIX IS TO BE PLACED WITHIN THE STRUCTURE. IF ACCEPTED, PEA ROCK PUMP MIX USE IS LIMITED TO VERTICAL ELEMENT POURS AND BEAM POURS LESS THAN 60 LINEAL FEET PER POUR.

CONCRETE DESIGN MIX SUBMITTALS SHALL INCLUDE TESTED, STATISTICAL BACK UP DATA AS PER CHAPTER 5 OF ACI 318.

ALL CONCRETE SHALL BE NORMAL WEIGHT OF 145 POUNDS PER CUBIC FOOT USING HARD ROCK AGGREGATES CONFORMING TO ASTM C33 U.N.O. LARGEST NOMINAL AGGREGATE SIZE SHALL BE 1-1/2" OR GREATER FOR SLABS ON GRADE AND 3/4" OR GREATER FOR ALL OTHER CONCRETE U.N.O.

PORTLAND CEMENT SHALL CONFORM TO ASTM C150. TYPE V CEMENT SHALL BE USED FOR CONCRETE IN CONTACT WITH EARTH. TYPE II CEMENT MAY BE USED ELSEWHERE.

MAX. SLUMP SHALL BE 5 INCHES. MIX WATER SHALL BE CLEAN AND POTABLE.

POST-INSTALLED ANCHORS:
1. POST-INSTALLED ANCHORS SHALL ONLY BE USED WHERE SPECIFIED ON THE DRAWINGS.
2. CONTRACTOR SHALL OBTAIN APPROVAL FROM ENGINEER OF RECORD PRIOR TO USING POST-INSTALLED ANCHORS FOR MISSING OR MISPLACED CAST-IN-PLACE ANCHORS.
3. CARE SHALL BE GIVEN TO AVOID CONFLICTS WITH EXISTING REBAR WHEN DRILLING HOLES. HOLES SHALL BE DRILLED AND CLEANED PER THE MANUFACTURER'S INSTRUCTIONS.
4. UNLESS SPECIFIED OTHERWISE, ANCHORS SHALL BE EMBEDDED IN THE APPROPRIATE SUBSTRATE WITH A MINIMUM EMBEDMENT OF 8 TIMES THE NOMINAL ANCHOR DIAMETER OR THE EMBEDMENT REQUIRED TO SUPPORT THE INTENDED LOAD. ANCHORS SHALL BE INSTALLED PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AT NOT LESS THAN MINIMUM EDGE DISTANCE AND/OR SPACINGS INDICATED IN THE MANUFACTURER'S LITERATURE.
5. SUBSTITUTION REQUESTS, FOR PRODUCTS OTHER THAN THOSE LISTED BELOW, SHALL BE SUBMITTED TO THE ENGINEER WITH CALCULATIONS THAT ARE PREPARED & SEALED BY A REGISTERED PROFESSIONAL ENGINEER SHOWING THAT THE SUBSTITUTED PRODUCT WILL ACHIEVE AN EQUIVALENT CAPACITY USING THE APPROPRIATE DESIGN PROCEDURE REQUIRED BY THE BUILDING CODE.
6. ACCEPTABLE PRODUCTS ARE:
   - A. EXPANSION ANCHORS FOR NON-CRACKED CONCRETE ONLY:
     - WEDGE-ALL (WA), BY SIMPSON STRONG-TIE
     - KWIK BOLT 3, BY HILTI
   - B. CRACKED CONCRETE MECHANICAL ANCHORS:
     - STRONG-BOLT (STB), BY SIMPSON STRONG-TIE
     - KWIK BOLT (TZ), BY HILTI
   - C. SCREW ANCHORS:
     - TITEN HD (THD), BY SIMPSON STRONG-TIE
     - HUS-H, BY HILTI
   - D. ADHESIVE ANCHORS:
     - a) FOR ANCHORING INTO SOLID BASE MATERIAL (CONCRETE AND GROUT-FILLED CMU):
       - ACRYLIC-TIE (AT)
       - SET EPOXY-TIE (SET) WITH RETROFIT BOLTS (RFB), BY SIMPSON STRONG-TIE
       - HIT RE 500, BY HILTI
     - b) FOR ANCHORING INTO HOLLOW BASE MATERIAL (HOLLOW CMU):
       - CONTACT ENGINEER OF RECORD

MASONRY WALLS:
PROVIDE HOT DIPPED GALVANIZED LADDER TYPE HORIZONTAL JOINT REINFORCEMENT (9 GA.) AT 16" ON CENTER VERTICAL IN ALL MASONRY WALLS. PROVIDE DOVE TAIL SLOT ANCHORS AT CONCRETE COLUMNS.

BLOCK CELLS SHALL BE GROUT FILLED WITH VERTICAL REINFORCING BARS AT CORNERS, INTERSECTIONS, WALL ENDS, EACH SIDE OF OPENINGS, AND AS SHOWN ON THE PLANS. DOWELS SHALL BE USED TO PROVIDE CONTINUITY INTO THE STRUCTURE ABOVE AND/OR BELOW, UNLESS NOTED OTHERWISE. USE METAL LATH, MORTAR, OR SPECIAL UNITS TO CONFINE CONCRETE AND GROUT TO AREA REQUIRED. MASONRY SHALL BE LAID IN RUNNING BOND PATTERN UNLESS NOTED OTHERWISE. INTERSECTING WALLS SHALL BE INTERLOCKED WITH TIE COLUMNS "TC" OR STRUCTURAL COLUMNS "C" AS NOTED ON THE PLANS.

MASONRY UNITS SHALL MEET ASTM C 90 FOR HOLLOW LOAD BEARING TYPE MASONRY WITH UNIT STRENGTH OF 1900 psi ON THE NET AREA (f'm = 1500 PSI). MORTAR SHALL BE TYPE "M" OR "S" AND MEET ASTM C 270. GROUT SHALL BE 2000 PSI MINIMUM COMPRESSIVE STRENGTH AND MEET ASTM C 476. PROVIDE HOOKED DOWELS IN FOOTINGS FOR VERTICAL REINFORCING ABOVE. LAP SPLICES 48 BAR DIAMETERS.

SUBMIT PROPOSED GROUT MIX DESIGN FOR REVIEW PRIOR TO USE. MIX SHALL BE UNIQUELY IDENTIFIED BY MIX NUMBER OR OTHER POSITIVE IDENTIFICATION. GROUT SLUMP SHALL BE BETWEEN 8 AND 11 INCHES. USE OF SUPERPLASTICIZER IS PROHIBITED.

MASONRY WALLS (CONT'D):
CELLS TO BE GROUT FILLED SHALL HAVE VERTICAL ALIGNMENT SUFFICIENT TO MAINTAIN A CLEAR, UNOBSTRUCTED, CONTINUOUS VERTICAL GROUT SPACE. CLEANOUT OPENINGS SHALL BE PROVIDED AT THE BOTTOM OF CELLS TO BE GROUT FILLED IN EACH POUR IN EXCESS OF 5 FEET IN HEIGHT. ANY OVERHANGING MORTAR OR OTHER OBSTRUCTION OR DEBRIS SHALL BE REMOVED FROM THE INSIDES OF SUCH CELL WALLS. THE CLEANOUTS SHALL BE SEALED BEFORE GROUTING, AFTER INSPECTION.

FOR JOINT REINFORCEMENT, WALL TIES, ANCHORS AND INSERTS, APPLY A MINIMUM COAT OF 1.5 OUNCES PER SQUARE FOOT (PSF) (458/G/M2) COMPLY WITH THE REQUIREMENTS OF ASTM A153, CLASS B.

VERTICAL REINFORCEMENT SHALL BE HELD IN POSITION AT TOP AND BOTTOM AND AT INTERVALS NOT EXCEEDING 192 BAR DIAMETERS. CELLS CONTAINING REINFORCEMENT SHALL BE FILLED SOLIDLY WITH GROUT. GROUT SHALL BE POURED IN LIFTS OF 4 FEET MAXIMUM HEIGHT. GROUT SHALL BE CONSOLIDATED AT TIME OF PLACING BY VIBRATING AND RECONSOLIDATED LATER BY VIBRATING BEFORE PLASTICITY IS LOST.

WHEN TOTAL GROUT POUR EXCEEDS 5 FEET IN HEIGHT, THE GROUT SHALL BE PLACED IN 4 FOOT LIFTS. MINIMUM CELL DIMENSION SHALL BE IN ACCORDANCE WITH TABLE 5 OF ACI 530.1 (3" X 3" FOR COARSE GROUT, 12 FT. MAXIMUM POUR HEIGHT).

WHEN THE GROUTING IS STOPPED FOR ONE HOUR OR LONGER, HORIZONTAL CONSTRUCTION JOINTS SHALL BE MADE BY STOPPING THE POUR OF GROUT NOT LESS THAN 1-1/2 INCH BELOW THE TOP OF THE UPPERMOST UNIT GROUTED.

MINIMUM LAP SPLICES FOR REINFORCED CMU PER 2007 FBC WITH 2009 SUPPLEMENTS SECTION 2107:

BAR SIZE				
#4	#5	#6	#7	#8
24"	30"	36"	66"	66"

LAP SPLICES THAT OCCUR AT CANTILEVERED WALLS SUCH AS: PARAPETS, RETAINING WALLS, ETC. SHALL HAVE LAP SPLICE LENGTHS INCREASED BY 50% TO 72 BAR DIAMETERS.

TIE BEAMS:
BEAMS WITH THE PREFIX "TB" AND/OR "*" SHALL BE OF CONCRETE, POURED AFTER THE BLOCK WALLS BELOW ARE IN PLACE. REINFORCING SHALL BE CONTINUOUS THROUGH TIE BEAMS WITH MINIMUM LAP SPLICES OF 48 BAR DIAMETERS AND BENT BARS AT CORNERS. USE METAL LATH, MORTAR, OR SPECIAL UNITS TO CONFINE CONCRETE TO AREA REQUIRED, IN ACCORDANCE WITH ACI 530.1 (SOLID METAL OR FELT CAVITY CAPS ARE PROHIBITED).

LINTELS & SILLS:
MASONRY OPENINGS LESS THAN 12 FEET SHALL BE SPANNED WITH 16" DEEP CONCRETE LINTELS WITH 2#5 REINFORCING BARS TOP AND BOTTOM. MASONRY OPENINGS LESS THAN 8 FEET SHALL BE SPANNED WITH 12" DEEP CONCRETE LINTELS WITH 2#5 REINFORCING BARS TOP AND BOTTOM. MASONRY OPENINGS LESS THAN 6 FEET SHALL BE SPANNED WITH 8" DEEP CONCRETE LINTELS WITH 2#5 REINFORCING BARS BOTTOM. LINTELS SHALL BEAR A MINIMUM OF 8" AT EACH END.

PROVIDE 8" X 8" MASONRY BEAM WITH 2 #5 CONT. AT EVERY WINDOW SILL. EXTEND BEAM 8" BEYOND EDGE OF OPENING.

STRUCTURAL STEEL:
ROLLED SHAPES SHALL CONFORM TO ASTM A-572 OR A-992 GRADE 50 AND "THE SPECIFICATION FOR DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC. SHOP CONNECTIONS TO BE WELDED (UTILIZING E70XX ELECTRODES) AND FIELD CONNECTIONS TO BE BOLTED, UNLESS OTHERWISE NOTED ON STRUCTURAL DRAWINGS. STEEL SHALL RECEIVE ONE SHOP COAT AND ONE FIELD TOUCH UP COAT OF APPROVED RUST INHIBITIVE PAINT, EXCEPT WHERE GALVANIZING IS INDICATED ON THE DRAWINGS.

STRUCTURAL TUBING SHALL CONFORM TO ASTM A 500, GRADE B, Fy = 46 KSI. STRUCTURAL PIPE SHALL CONFORM TO ASTM A 53 GRADE B, TYPE E OR S, Fy = 35 KSI. BEAM CONNECTIONS TO TUBE COLUMNS SHALL BE A.I.S.C. THRU-PLATE TYPE UNLESS SHOWN OTHERWISE.

BOLTED CONNECTIONS SHALL CONSIST OF MINIMUM 3/4 INCH DIAMETER ASTM A 325-N HIGH STRENGTH BOLTS. CONNECTIONS SHALL NOT HAVE LESS THAN 2 ROWS OF BOLTS. ANCHOR BOLTS SHALL CONFORM TO ASTM A 307 OR A 36 (THREADED ROD). ALL BOLTED CONNECTIONS SHALL BE VISUALLY INSPECTED. TWENTY FIVE PERCENT OF ALL SLIP CRITICAL BOLTED CONNECTIONS SHALL BE TESTED.

ASTM SPECIFICATION A 36 FOR MISCELLANEOUS STEEL SHAPES (ANGLES, PLATES, ETC.).

STEEL BEAMS SHALL HAVE THE FOLLOWING CAMBERS UNDER THEIR OWN WEIGHTS:

40' SPAN OR LESS – CAMBER = 0

STRUCTURAL STEEL BOLTS, ANCHORS, ETC., SHALL CONFORM TO THE FOLLOWING STANDARDS AND MATERIAL PROPERTIES U.N.O:

COMPONENT:	STANDARD:	Fy:
BOLTS	ASTM A325	---
	OR ASTM A490 WHERE NOTED	---
NUTS	ASTM A563	---
WASHERS	ASTM F436	---
ANCHOR RODS	ASTM F1554, GRADE 36	36 KSI
	OR GRADE 55 WHERE NOTED (GRADE 55 RODS SHALL COMPLY WITH WELDABILITY SUPPLEMENT S1)	55 KSI
WASHERS (AT ANCHOR RODS)	ASTM A36	36 KSI
	OR ASTM F844 (USS STANDARD) (F844 WASHERS PERMITTED ONLY FOR 3/4" DIA. RODS AT 1 1/16" MAX. DIA. HOLES IN BASE PLATE WHERE NO WELD REQ'D. BETWEEN WASHER AND BASE PLATE)	---

ALL BOLTS SHALL BE INSTALLED AS BEARING-TYPE CONNECTIONS WITH THREADS EXCLUDED FROM SHEAR PLANE (TYPE "X" CONNECTION) U.N.O. HIGH-STRENGTH BOLT ASSEMBLIES SHALL BE IN ACCORDANCE WITH THE RCSC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS" AND SHALL BE SNUG TIGHTENED USING ANY AISC APPROVED METHOD U.N.O. ALL BOLTS IN SLOTTED OR OVERSIZED HOLES AND ALL HIGH-STRENGTH BOLTS SHALL BE INSTALLED WITH HARDENED WASHERS.

ALL CONNECTIONS INVOLVING WOOD MEMBERS, INCLUDING THOSE WITH THREADED ROD, THREADED STUDS, FOUNDATION ANCHOR BOLTS, THRU-BOLTS, ETC., SHALL USE ASTM A307 MATERIAL U.N.O. ALL BOLTS, ANCHOR BOLTS, EXPANSION BOLTS, ETC., SHALL BE INSTALLED WITH STEEL WASHERS AT FACE OF WOOD.

SHEAR STUD CONNECTORS:
SHEAR STUD CONNECTORS SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH AWS D1.1 "STRUCTURAL WELDING CODE", SECTION 7 STUD WELDING. WHERE STUDS ARE PART OF A COMPOSITE FLOOR SYSTEM, STUD WELDING SHALL BE BY AUTOMATIC WELDING EQUIPMENT ONLY. HAND WELDING OF STUDS IS NOT ALLOWED. STUDS SHALL BE TYPE 'B', HEADED STUDS HAVING A MINIMUM TENSILE STRENGTH OF 60,000 PSI., AND SHALL BE OF LENGTH AND DIAMETER SHOWN ON STRUCTURAL DRAWINGS.

HEADED STUDS AND AUTOMATIC WELDED DOWELS SHOWN ON PLANS OR DETAILS SHALL BE BY NELSON STUD WELDING, INC., PER ICC ER-2614 AND ICC ER-5217, RESPECTIVELY. STUDS SHALL HAVE FLUXED ENDS AND BE AUTOMATICALLY END-WELDED WITH SUITABLE EQUIPMENT (NO FILLET WELDING OF STUDS PERMITTED U.N.O.) AT SPACINGS INDICATED ON THE PLANS OR DETAILS. WELDING OF STUDS SHALL CONFORM TO THE REQUIREMENTS OF AWS D1.1 AND AWS C5.4. HEADED STUDS AND AUTOMATIC WELDED DOWELS BY OTHER MANUFACTURERS MAY BE SUBSTITUTED PROVIDED THEY ARE OF EQUIVALENT CAPACITY FOR THE INTENDED APPLICATION AND HAVE CURRENT ICC APPROVAL.

WELDING:
WELDING SHALL BE DONE BY WELDERS WITH CURRENT CERTIFICATION USING ASTM E70 SERIES ELECTRODE FOR SHOP WELDING A36 STEEL, AND E70 SERIES LOW HYDROGEN ELECTRODES FOR ALL WELDING OF HIGH STRENGTH STEELS AND FOR FIELD WELDING.

WELDS SHOWN ON STRUCTURAL DRAWINGS ARE MINIMUM DESIGN REQUIREMENTS. THE FABRICATOR'S SHOP DRAWINGS SHALL REFLECT WELDS IN ACCORDANCE WITH AWS REQUIREMENTS.

WELDS SHALL BE VISUALLY INSPECTED WITH 25% ULTRASONIC TESTED UNLESS NOTED OTHERWISE.

PROVIDE FILLET WELDS AT CONTACT POINTS BETWEEN STEEL MEMBERS SUFFICIENT TO DEVELOP THE ALLOWABLE TENSILE STRENGTH OF THE SMALLER MEMBER AT THE JOINT UNLESS DETAILED OTHERWISE ON THE DRAWINGS.

STEEL DECK:
2", 20 GA. TYPE 2C METAL DECK GALVANIZED AS SHOWN ON ROOF PLAN AS MANUFACTURED BY VULCRAFT/NUCOR OR APPROVED EQUAL. MANUFACTURER SHALL BE A MEMBER OF THE STEEL DECK INSTITUTE. ROOF DECK MUST COMPLY WITH STEEL DECK INSTITUTE STANDARDS. ALL ROOF DECK SHALL BE CONTINUOUS OVER A MINIMUM OF THREE SPANS.

2" METAL DECK IS TO BE ATTACHED TO STRUCTURAL STEEL SUPPORTS WITH 5/8" DIAMETER PUDDLE WELDS (MINIMUM OF 5 WELDS PER SHEET PER BEAM). SIDE JOINTS SHALL BE FASTENED TOGETHER WITH #10 SELF DRILLING SCREWS AT MID SPAN BETWEEN SUPPORTS MINIMUM OF 3 PER SPAN), UNLESS INDICATED OTHERWISE ON THE DRAWINGS.

SUBMITTALS:
SHOP DRAWINGS OR REPORTS FOR THE FOLLOWING ITEMS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD PRIOR TO FABRICATION OR CONSTRUCTION (AS APPLICABLE) U.N.O.

REINFORCING STEEL
MASONRY GROUT AND MORTAR MIX DESIGNS
CONCRETE MIX DESIGNS
ROOF FRAMING PLAN

CONTRACTOR SHALL REVIEW AND STAMP SHOP DRAWINGS PRIOR TO SUBMITTING. CONTRACTOR'S REVIEW SHALL CHECK FOR COMPLETENESS/COMPLIANCE WITH CONTRACT DOCUMENTS.

SHOP DRAWINGS ARE REVIEWED BY ENGINEER ONLY FOR GENERAL COMPLIANCE WITH THE STRUCTURAL DRAWINGS. RESPONSIBILITY FOR CORRECTNESS SHALL REST WITH THE CONTRACTOR. SHOP DRAWINGS DO NOT SUPERSEDE OR REPLACE THE CONTRACT DRAWINGS OR SPECIFICATIONS. CHANGES, SUBSTITUTIONS, OR DEVIATIONS FROM CONTRACT DRAWINGS AND/OR SPECIFICATIONS WILL NOT BE ACCEPTED VIA SHOP DRAWING REVIEW. ALL SUCH MODIFICATIONS SHALL BE SUBMITTED SEPARATELY FOR ENGINEER'S REVIEW.

FOR ALL SUBMITTALS, ANY CORRECTIONS NOTED WILL BE MARKED ON ONE (1) COPY SET ONLY AND RETURNED. ADDITIONAL COPIES OF ANY SUBMITTAL WILL BE RETURNED UNMARKED. CONTRACTOR SHALL BE RESPONSIBLE FOR REPRODUCING ENGINEER'S CORRECTIONS ON ADDITIONAL COPIES REQ'D. ONE COPY SET MAY BE RETAINED FOR THE ENGINEER'S RECORDS. ALLOW FIVE (5) TO TEN (10) WORKING DAYS FOR THE ENGINEER'S REVIEW.

REVISIONS

NO.	DATE	REMARKS

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DATE: August, 2024
DRAWN BY: DC
CHECKED BY: DC
APPROVED BY: DC

PROJECT NO.:
CONTRACT NO.:

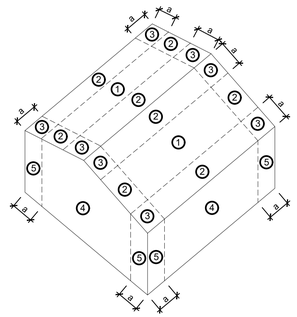
SHEET NO.: S001

STRUCTURAL NOTES

LICENSED PROFESSIONAL ENGINEER
DAMIAN CARTWRIGHT
28851-IB
STATE OF VIRGIN ISLANDS

ABBREVIATIONS

AB	– ANCHOR BOLT	K	– KIP(s)
ALT	– ALTERNATE	KIP(s)	– 1000 POUNDS
APPROX	– APPROXIMATELY	KLF	– KIPS PER LINEAR FOOT
ARCH	– ARCHITECT	KJ	– CONSTRUCTION JOINT
ARCH'L	– ARCHITECTURAL	L	– ANGLE
B/	– BOTTOM OF	LG	– LONG
BC	– BOTTOM CHORD	LLH	– LONG LEG HORIZONTAL
BLDG	– BUILDING	LLV	– LONG LEG VERTICAL
BM	– BEAM	LP	– LOW POINT
BOTT	– BOTTOM	LW	– LONG WAY
BRG	– BEARING	MFR	– MANUFACTURER
C/C	– CENTER TO CENTER	MAS	– MASONRY
CIP	– CAST IN PLACE	MO	– MASONRY OPENING
CJ	– CONTRACTION JOINT	MAT'L	– MATERIAL
CL	– CENTERLINE	MAX	– MAXIMUM
CLR	– CLEAR	MECH'L	– MECHANICAL
CMU	– CONCRETE MASONRY UNIT	MTL	– METAL
COL	– COLUMN	MIN	– MINIMUM
CONC	– CONCRETE	MISC	– MISCELLANEOUS
CONFIG	– CONFIGURATION	NS	– NEAR SIDE
CONT	– CONTINUOUS	NIC	– NOT IN CONTRACT
CONTR	– CONTRACTOR	NTS	– NOT TO SCALE
CTR	– CENTER	OC	– ON CENTER
DBL	– DOUBLE	OH	– OPPOSITE HAND
DET	– DETAIL	OPNG	– OPENING
DIA	– DIAMETER	PAF	– POWDER ACTUATED FASTENERS
DIM	– DIMENSION	PART	– PARTITION
DN	– DOWN	PART'L	– PARTIAL
DR	– DOOR/DRAIN	PL	– PLATE
DWG	– DRAWING	PLF	– POUNDS PER LINEAR FOOT
EA	– EACH	PSF	– POUNDS PER SQUARE FOOT
EE	– EACH END	PSI	– POUNDS PER SQUARE INCH
EF	– EACH FACE	PT	– PRESSURE TREATED
EJ	– EXPANSION JOINT	R	– RISER/RADIUS
EL	– ELEVATION	REG	– REGULAR
ELEV	– ELEVATION	REINF	– REINFORCING
ENGR	– ENGINEER	REM	– REMAINDER
EOR	– ENGINEER OF RECORD	REQ'D	– REQUIRED
EOS	– EDGE OF SLAB	REV	– REVISED/REVISION
EQ	– EQUAL	RM	– ROOM
EW	– EACH WAY	RO	– ROUGH OPENING
EXIST	– EXISTING	RQMTS	– REQUIREMENTS
EXP	– EXPANSION	SCHED	– SCHEDULE
EXT	– EXTERIOR	SECT	– SECTION
FIN	– FINISH	SIM	– SIMILAR
FLR	– FLOOR	SL	– SLOPE
FND	– FOUNDATION	SOG	– SLAB–ON–GRADE
FOM	– FACE OF MASONRY	SP	– SPIRAL
FS	– FAR SIDE	SQ	– SQUARE
FT	– FOOT	SS	– STAINLESS STEEL
FTG	– FOOTING	STD	– STANDARD
GA	– GAGE	STL	– STEEL
GALV	– GALVANIZED	STRUCT'L	– STRUCTURAL
GC	– GENERAL CONTRACTOR	SW	– SHEARWALL/SHORT WAY
HDG	– HOT DIPPED GALVANIZED	T/	– TOP OF
HG	– HIP GIRDER	TB	– TIE BEAM
HK	– HOOK	TC	– TIE COLUMN
HORIZ	– HORIZONTAL	TEMP	– TEMPERATURE
HP	– HIGH POINT	CC	– CONCRETE COLUMN
HS	– HIGH STRENGTH	T/O	– THRU OUT
IJ	– ISOLATION JOINT	TR	– TREAD/TRUSS
INFO	– INFORMATION	TYP	– TYPICAL
INT	– INTERIOR	UNO	– UNLESS NOTED OTHERWISE
IRR	– IRREGULAR	VERT	– VERTICAL
JR	– JAMB REINFORCING	W/	– WITH
JT	– JOINT	W/O	– WITHOUT
		WD	– WOOD
		WP	– WORK POINT
		WWF	– WELDED WIRE FABRIC



COMPONENT AND CLADDING WIND PRESSURES (EXCLUDES SAFE ROOM)

WIND DESIGN CRITERIA

DESIGN WIND SPEED	175 MPH
BUILDING CLASSIFICATION	IV
IMPORTANCE FACTOR	1.15
EXPOSURE CATEGORY	C
ENCLOSURE CLASSIFICATION	ENCLOSED BUILDING
INTERNAL PRESSURE COEFFICIENT	± 0.18

a = 6.40 FT.

ROOF	NET SURFACE DESIGN PRESSURE (PSF)				
AREA	10 SF.	20 SF.	50 SF.	100 SF.	500 SF.
NEGATIVE ZONE 1	–105.04	–98.11	–88.95	–82.02	–65.93
NEGATIVE ZONE 2	–138.56	–129.65	–117.87	–108.96	–88.28
NEGATIVE ZONE 3	–188.84	–171.02	–147.47	–129.65	–88.28
POSITIVE FOR ALL ZONES	26.82	25.14	22.91	21.23	21.23

WALLS	NET SURFACE DESIGN PRESSURE (PSF)				
AREA	10 SF.	20 SF.	50 SF.	100 SF.	500 SF.
NEGATIVE ZONE 4	–65.37	–62.70	–59.16	–56.49	–50.28
NEGATIVE ZONE 5	–80.45	–75.11	–68.04	–62.70	–50.28
POSITIVE ZONES 4 & 5	60.34	57.67	54.13	51.46	45.26

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HURRICANE SAFE ROOM DESIGN CRITERIA AS PER ICC 500–2020 AND FEMA P–361

GENERAL

1. THE SAFE ROOM DESIGN CONFORMS TO ICC 500 STANDARDS FOR THE DESIGN AND CONSTRUCTION OF STORM SHELTERS EDITION 2020 AND FEMA FUNDING CRITERIA OF FEMA P–361, CURRENT EDITION.
2. ROOF DESIGN LIVE LOAD = 50 PSF (ICC 500–2020 – HURRICANE SHELTER)
3. FLOOR DESIGN LIVE LOAD = 100 PSF (GENERAL ASSEMBLY)
3. SITE IS LOCATED IN FEMA FLOOD ZONE X – AREA OF MINIMAL FLOOD HAZARD. SAFE ROOM FINISH FLOOR ELEVATION (F.F.E.) OF 25.50 FT. IS 5.50 FT. ABOVE ADJACENT EXISTING GRADE OF 20.00 FT. USVI FLOOD ADVISORY MAP ILLUSTRATES THE 100–YR (1% ANNUAL CHANCE) FLOOD ELEVATION ADJACENT TO THE SAFE ROOM LOCATION AT 17.00 FT. SAFE ROOM F.F.E. IS 8.50 FT ABOVE 100–YR STORM STAGE.
4. 500–YR (0.2% ANNUAL CHANCE) FLOOD ELEVATION ADJACENT TO THE SAFE ROOM LOCATION IS 17.90 FT. SAFE ROOM F.F.E. OF 25.50 FT. IS 7.60 FT. ABOVE 500–YR STORM STAGE.
5. THE SAFE ROOM IS NOT LOCATED IN AN AREA SUBJECTED TO LAY–DOWN AND FALLING DEBRI HAZARDS.
6. THE SAFE ROOM IS NOT LOCATED IN AN AREA SUBJECTED TO STORM SURGE.
7. THE SAFE ROOM NATURAL VENTILATION (IE. EXTERIOR WINDOWS AND DOORS) SHALL BE IMPACT RESISTANT AND MEET THE COMPONENT AND CLADDING WIND PRESSURES (C&C) SHOWN ON THESE PLANS BASED UPON THE RESPECTIVE OPENING SIZE AREA.
8. RAIN LOADS ESTABLISHED BY ADDING A RATE OF 6–INCHES PER HOUR TO THE RAINFALL RATE ESTABLISHED IN FIGURE 303.2 OF ICC 500

ASCE 7–16 WIND LOAD ANALYSIS DESIGN CRITERIA

DESIGN WIND SPEED	277 MPH
BUILDING CLASSIFICATION	IV
IMPORTANCE FACTOR	1.15
EXPOSURE CATEGORY	D
ENCLOSURE CLASSIFICATION	ENCLOSED BUILDING
INTERNAL PRESSURE COEFFICIENT	± 0.18

ROOF TYPE, WALL TYPE & MISSILE IMPACT DESIGN CRITERIA

ROOF TYPE AND WALL TYPE IS 10–INCH THICK FULLY POURED 4,000 PSI REINFORCED CONCRETE. REINFORCEMENT EXCEEDS THE MIN. REQUIRED #4 @ 12" O.C. EACH WAY.

MISSILE PROJECTILE IS 9–LB 2"X4" SAWN LUMBER. VERTICAL SURFACES MISSILE SPEED = 105 MPH. HORIZONTAL SURFACES MISSILE SPEED = 21 MPH.

HYDROSTATIC LOADS DESIGN CRITERIA

CISTERN BENEATH SAFE ROOM HAS BEEN DESIGN FOR HYDROSTATIC LOADS ASSUMING SURROUNDING WATER TABLE ELEVATION IS UP TO THE F.F.E. OF SAFE ROOM.

COMPONENT AND CLADDING WIND PRESSURES (SAFE ROOM)

WIND DESIGN CRITERIA

DESIGN WIND SPEED	277 MPH
BUILDING CLASSIFICATION	IV
IMPORTANCE FACTOR	1.15
EXPOSURE CATEGORY	D
ENCLOSURE CLASSIFICATION	ENCLOSED BUILDING
INTERNAL PRESSURE COEFFICIENT	± 0.18

a = 3.30 FT.

ROOF	NET SURFACE DESIGN PRESSURE (PSF)				
AREA	10 SF.	20 SF.	50 SF.	100 SF.	500 SF.
NEGATIVE ZONE 1	–318.63	–297.61	–269.82	–248.80	–199.99
NEGATIVE ZONE 2	–420.32	–393.29	–357.56	–330.54	–267.78
NEGATIVE ZONE 3	–572.85	–518.80	–447.34	–393.29	–267.78
POSITIVE FOR ALL ZONES	81.35	76.25	69.51	64.40	64.40

WALLS	NET SURFACE DESIGN PRESSURE (PSF)				
AREA	10 SF.	20 SF.	50 SF.	100 SF.	500 SF.
NEGATIVE ZONE 4	–198.29	–190.19	–179.47	–171.36	–152.53
NEGATIVE ZONE 5	–244.05	–227.84	–206.40	–190.19	–152.53
POSITIVE ZONES 4 & 5	183.04	174.93	164.21	156.11	137.28

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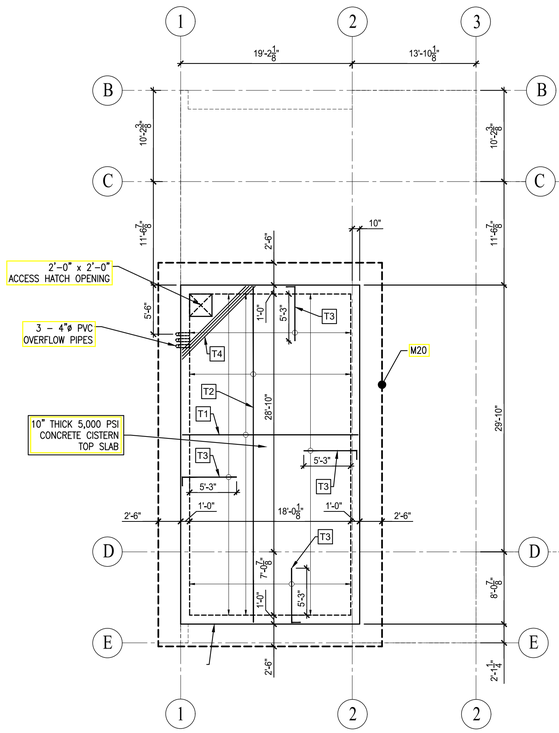
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STRUCTURAL NOTES





CISTERN LEVEL PLAN

SCALE: 1/8" = 1'-0"

CISTERN TOP SLAB

T1	#8 @ 6" O.C. BOTTOM (SHORT SPAN), AND #5 @ 8" O.C. TOP (SHORT SPAN)
T2	#6 @ 8" O.C. BOTTOM, TEMP. & SHRINKAGE (LONG SPAN); & #5 @ 8" O.C. TOP, TEMP. & SHRINKAGE (LONG SPAN)
T3	#5 "L" SHAPED DOWELS @ 8" O.C. TOP, ALL AROUND, 4'-0" SIDE ANCHORED INTO WALLS
T4	PROVIDE 4 - #8 BARS X 11'-6" LONG AT CORNER OF SLAB OPENING, TOP & BOTTOM

6'-0" / 4'-0"

CISTERN NOTES

1. CISTERN CONCRETE TOP SLAB SHALL BE 10" THICK 5,000 PSI., REINFORCED AS SHOWN ON PLANS.
2. CISTERN TOP SLAB DESIGN LOADS:

   DEAD LOAD = 125 PSF
   LIVE LOAD = 100 PSF

FOOTING SCHEDULE

MARK	SIZE	REINFORCEMENT	REMARKS
WF30	2'-6" CONT. X 18" DEEP	(3)-#5 CONTINUOUS AND #4@12" O.C. TRANSVERSE, TOP & BOTTOM	VERTICAL DOWEL TO MATCH WALL REINFORCEMENT IN SIZE AND SPACING
WF36	3'-0" CONT. X 18" DEEP	(4)-#5 CONTINUOUS AND #5@10" O.C. TRANSVERSE, TOP & BOTTOM	VERTICAL DOWEL TO MATCH WALL REINFORCEMENT IN SIZE AND SPACING
WF48	4'-0" CONT. X 18" DEEP	(6)-#5 CONTINUOUS AND #5@10" O.C. TRANSVERSE, TOP & BOTTOM	VERTICAL DOWEL TO MATCH WALL REINFORCEMENT IN SIZE AND SPACING
F1	6'-0" X 6'-0" X 30" DEEP	(9)-#6 EACH WAY EQUALLY SPACED, TOP & BOTTOM	VERTICAL DOWEL TO MATCH COLUMN REINFORCEMENT IN SIZE AND SPACING
F2	4'-0" X 4'-0" X 24" DEEP	(6)-#6 EACH WAY EQUALLY SPACED, TOP & BOTTOM	VERTICAL DOWEL TO MATCH COLUMN REINFORCEMENT IN SIZE AND SPACING
F3	7'-0" X 7'-0" X 30" DEEP	(11)-#6 EACH WAY EQUALLY SPACED, TOP & BOTTOM	VERTICAL DOWEL TO MATCH COLUMN REINFORCEMENT IN SIZE AND SPACING
M20	SEE PLAN x 20" DEEP	#6 @ 8" O.C. (SHORT SPAN) AND #5 @ 8" O.C. (LONG SPAN), TOP & BOTTOM	VERTICAL DOWEL TO MATCH WALL REINFORCEMENT IN SIZE AND SPACING

* ALL FOOTINGS SHALL BE CONSTRUCTED ON CLEAN SUITABLE INSITU SOILS COMPACTED TO 98% MODIFIED PROCTOR

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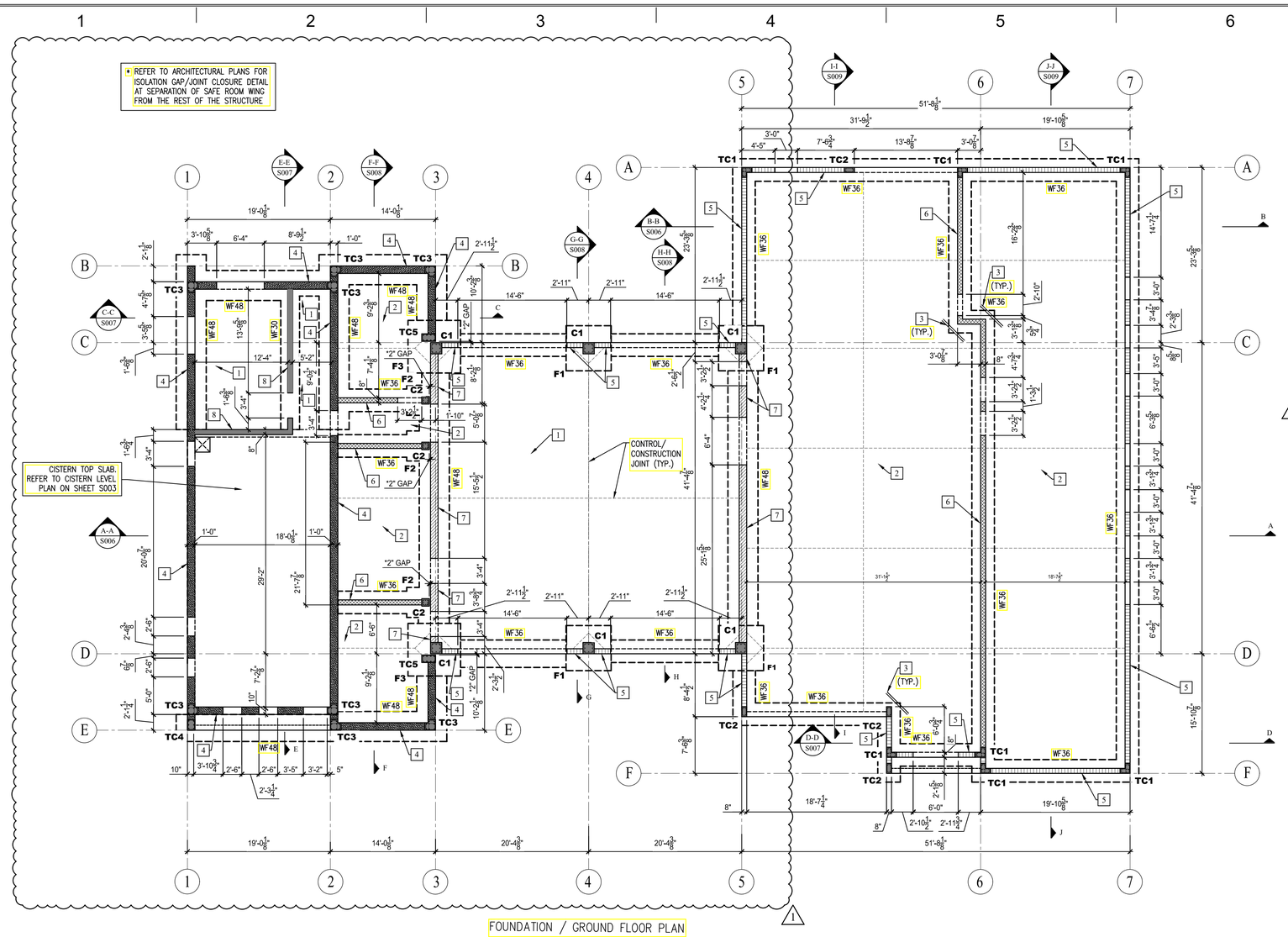
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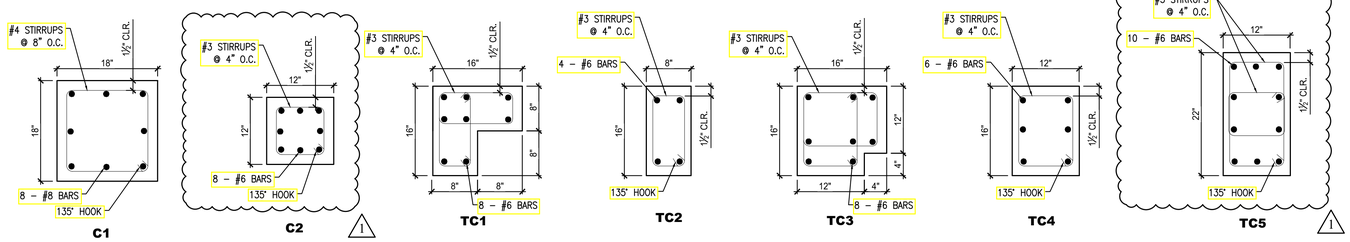
CISTERN LEVEL PLAN

INTERNATIONAL ENGINEER
DAMIAN CARTWRIGHT
28851-1B



FOUNDATION / GROUND FLOOR PLAN

SCALE: 1/8" = 1'-0"



COLUMN SCHEDULE

SCALE: NTS

NOTES:

1. ALL STRUCTURAL STEEL SHALL BE ASTM A–572 GRADE 50 (50 KSI YIELD).
2. ALL REBAR SHALL BE GRADE 60.
3. COORDINATE THIS SHEET WITH ARCHITECTURAL AND M.E.P. DRAWINGS. NOTIFY E.O.R. OF ANY DISCREPANCIES PRIOR TO PROCEEDING.
4. ENGINEER SHALL BE CALLED ONSITE TO INSPECT SUBSURFACE SOIL CONDITIONS PRIOR TO CONSTRUCTING FOOTINGS.
5. PROVIDE A 6" CAPILLARY BREAK BENEATH ALL SLABS ON GRADE CONSISTING OF UNIFORMLY GRADED WASHED #57 (¾") STONE. COMPACT TO 98% MODIFIED PROCTOR.

LEGEND

- 12" POURED CONCRETE WALL REINFORCED WITH 1–#6 VERTICAL REINF. @ 10" O.C. AND 1–#5 HORIZONTAL REINFORCEMENT @ 10" O.C., BOTH FACES.
- 8" C.M.U. WALL REINFORCED WITH 1–#6 VERTICAL REINF. @ 8" O.C. IN FULLY GROUTED CELL, DURO–WALL HORIZONTAL JOINT REINF. @ 16" O.C., AND HORIZONTAL BOND BEAM EVERY 4'–0" O.C. REINF. WITH 1–#4 CONTINUOUS
- 8" C.M.U. WALL REINFORCED WITH 1–#5 VERTICAL REINF. @ 8" O.C. IN FULLY GROUTED CELL, DURO–WALL HORIZONTAL JOINT REINF. @ 16" O.C., AND HORIZONTAL BOND BEAM EVERY 4'–0" O.C. REINF. WITH 1–#4 CONTINUOUS
- 12" C.M.U. WALL REINFORCED WITH 1–#6 VERTICAL REINF. @ 8" O.C. IN FULLY GROUTED CELL, DURO–WALL HORIZONTAL JOINT REINF. @ 16" O.C., AND HORIZONTAL BOND BEAM EVERY 4'–0" O.C. REINF. WITH 2–#5 CONTINUOUS
- 8" C.M.U. WALL REINFORCED WITH 1–#5 VERTICAL REINF. @ 48" O.C. IN FULLY GROUTED CELL AND DURO–WALL HORIZONTAL JOINT REINF. @ 16" O.C.

1. FLOOR SLAB IN APPARATUS BAYS AND GENERATOR ROOM SHALL BE 8" THICK 4000 PSI CONCRETE REINFORCED WITH #5 REBAR @ 8" O.C. EACH WAY. PLACE SLAB ON MIN. 10 MIL VAPOR BARRIER AND COMPACTED TERMITE TREATED SUBGRADE.
2. FLOOR SLAB IN OFFICES SHALL BE 5" THICK 4000 PSI CONCRETE REINFORCED WITH 6"X6" W2.9/W2.9 WELDED WIRE FABRIC. PLACE SLAB ON MIN. 10 MIL VAPOR BARRIER AND COMPACTED TERMITE TREATED SUBGRADE.
3. PROVIDE 2 – #4 BARS X 4'–0" LONG AT ALL CORNERS OF SLAB OPENING
4. 12" POURED CONCRETE WALL REINFORCED WITH 1–#6 VERTICAL REINF. @ 10" O.C. AND 1–#5 HORIZONTAL REINFORCEMENT @ 10" O.C., BOTH FACES.
5. 8" C.M.U. WALL REINFORCED WITH 1–#6 VERTICAL REINF. @ 8" O.C. IN FULLY GROUTED CELL, DURO–WALL HORIZONTAL JOINT REINF. @ 16" O.C., AND HORIZONTAL BOND BEAM EVERY 4'–0" O.C. REINF. WITH 1–#4 CONTINUOUS
6. 8" C.M.U. WALL REINFORCED WITH 1–#5 VERTICAL REINF. @ 8" O.C. IN FULLY GROUTED CELL, DURO–WALL HORIZONTAL JOINT REINF. @ 16" O.C., AND HORIZONTAL BOND BEAM EVERY 4'–0" O.C. REINF. WITH 1–#4 CONTINUOUS
7. 12" POURED CONCRETE WALL REINFORCED WITH 1–#6 VERTICAL REINF. @ 8" O.C. IN FULLY GROUTED CELL, DURO–WALL HORIZONTAL JOINT REINF. @ 16" O.C., AND HORIZONTAL BOND BEAM EVERY 4'–0" O.C. REINF. WITH 2–#5 CONTINUOUS
8. 8" C.M.U. WALL REINFORCED WITH 1–#5 VERTICAL REINF. @ 48" O.C. IN FULLY GROUTED CELL AND DURO–WALL HORIZONTAL JOINT REINF. @ 16" O.C.

JOINT SEALING

1. ALL CONCRETE SURFACES AND JOINTS SHALL BE FLUSHED CLEAN WITH WATER AFTER BOTH INITIAL AND FINAL SAW– CUTS, PRIOR TO SAWCUT SLURRY DRYING.
2. AFTER SECOND SAWCUT, JOINT FACES SHALL BE SAND BLASTED AND AIR–BLOWN.
3. SEAL RESERVOIR SHALL BE FORMED USING SECOND SAWCUT. SHOULDERED BLADE SHALL NOT BE USED WITH INITIAL SAWCUT.
4. INSERT TEMPORARY BACKER ROD AFTER INITIAL SAWCUT TO PREVENT DEBRIS INTRUSION.
5. FOR ALL JOINTS THE BACKER ROD MATERIAL SHALL BE COMPATIBLE WITH THE COLD POURED SEALANT AND SLIGHTLY OVERSIZED TO PREVENT MOVEMENT DURING THE JOINT SEALANT OPERATION.
6. TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED ONLY WHEN APPROVED BY THE ENGINEER.

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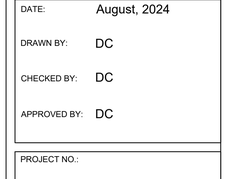
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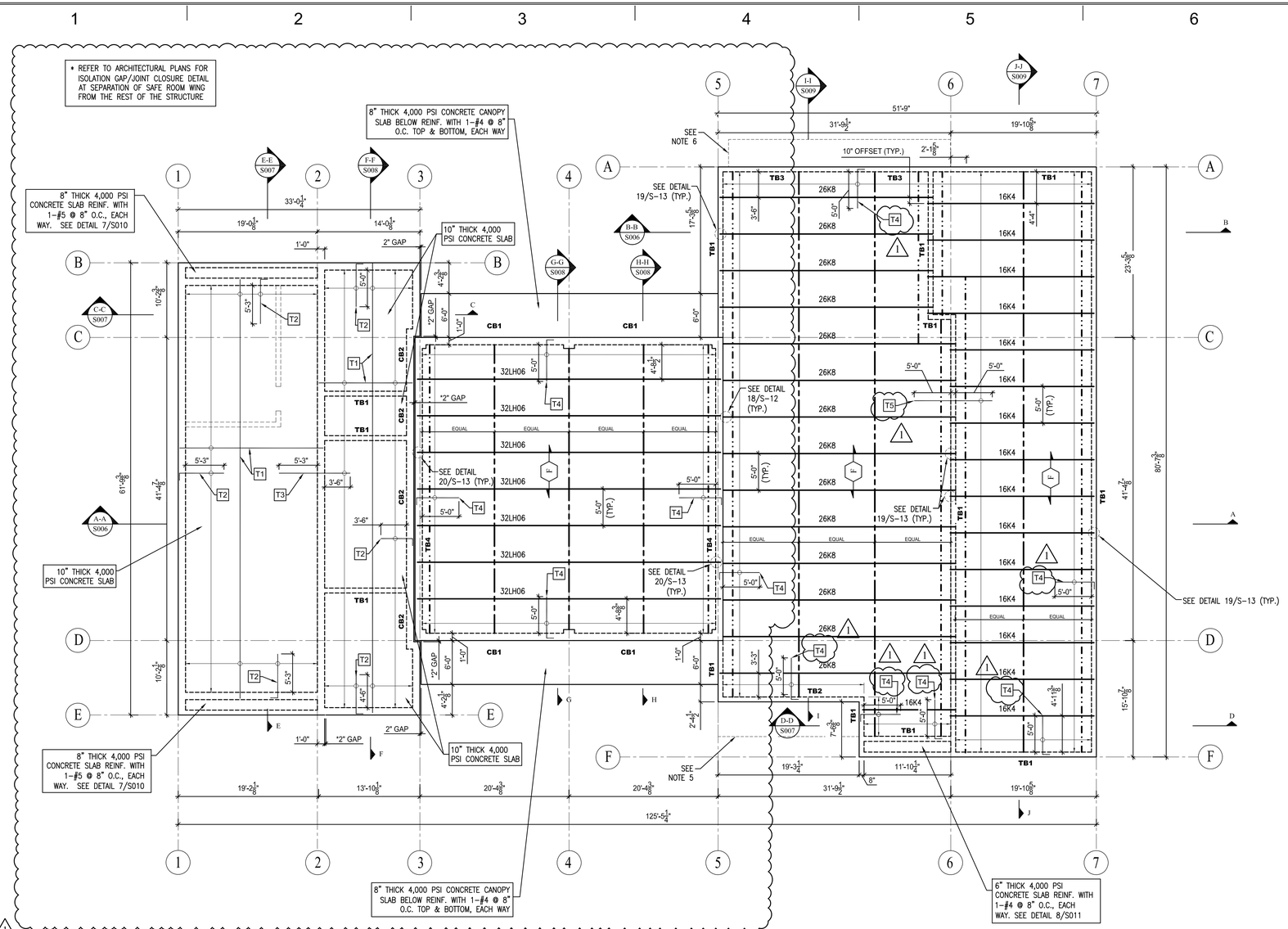
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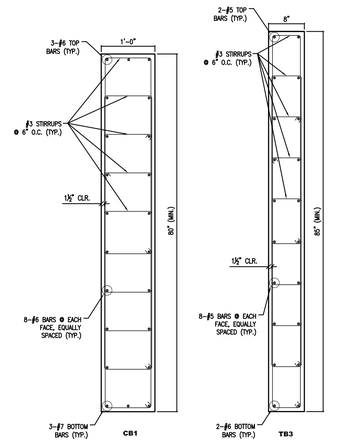
FOUNDATION / GROUND FLOOR PLAN





ROOF FRAMING PLAN

SCALE: 1/8" = 1'-0"



NOTES:

1. F — DENOTES SPAN OF 25½" NORMAL WEIGHT CONCRETE OVER 2" DEEP 20 GA. NON–COMPOSITE GALVANIZED STEEL DECK. REINFORCE WITH 6"X6" W2.9 X W2.9 WELDED WIRE FABRIC. TOTAL SLAB DEPTH = 4½".
2. ALL STRUCTURAL STEEL SHALL BE ASTM A–572 GRADE 50 (50 KSI YIELD).
3. ALL REBAR SHALL BE GRADE 60.
4. COORDINATE THIS SHEET WITH ARCHITECTURAL AND M.E.P. DRAWINGS. NOTIFY E.O.R. OF ANY DISCREPANCIES PRIOR TO PROCEEDING.
5. PRE–ENGINEERED SUNSCREEN OVERHANG. REFER TO ARCHITECTURAL PLANS FOR DETAILS. SUNSCREEN AND CONNECTION TO CONCRETE TIE BEAM TB2 SHALL BE DESIGNED BY THE DELEGATED ENGINEER AND SIGNED AND SEALED SHOP DRAWINGS PROVIDED TO THE EOR FOR REVIEW.
6. PRE–ENGINEERED COMPOSITE PANEL OVERHANG. REFER TO ARCHITECTURAL PLANS FOR DETAILS. COMPOSITE PANEL AND CONNECTION TO CONCRETE TIE BEAM TB3 SHALL BE DESIGNED BY THE DELEGATED ENGINEER AND SIGNED AND SEALED SHOP DRAWINGS PROVIDED TO THE EOR FOR REVIEW.

BEAM SCHEDULE

BEAM MARK	SIZE WxH [in]	REINFORCING BOTT.	REINFORCING TOP	STIRRUPS	HAIRPINS	REMARKS
CB1	12"x80" (MIN.)	3#7	3#6	#3@6" O.C.		8–#6 AT EACH FACE, EQUALLY SPACED (SEE BEAM DIAGRAM)
CB2	12"x30"	3#6	3#5	#3@4" O.C.	#3@6" O.C.	2–#5 AT EACH FACE, EQUALLY SPACED (SEE BEAM DIAGRAM)
TB1	8"x24" (MIN.)	2#6	2#5	#3@6" O.C.	#3@6" O.C.	2–#5 AT EACH FACE, EQUALLY SPACED (SEE BEAM DIAGRAM)
TB2	8"x63" (MIN.)	2#6	2#5	#3@6" O.C.		6–#5 AT EACH FACE, EQUALLY SPACED (SEE BEAM DIAGRAM)
TB3	8"x85" (MIN.)	2#6	2#5	#3@6" O.C.		8–#5 AT EACH FACE, EQUALLY SPACED (SEE BEAM DIAGRAM)
TB4	12"x24" (MIN.)	3#6	3#5	#3@8" O.C.	#3@8" O.C.	2–#5 AT EACH FACE, EQUALLY SPACED (SEE BEAM DIAGRAM)

NOTES:
1. START STIRRUP SPACING 3" FROM FACE OF SUPPORT.
2. BEAMS NOTED AS 8" & 12" WIDE MAY BE 7⅝" & 11⅝" WIDE (MASONRY DIMENSIONS).
3. SCHEDULED DEPTHS FOR ALL TIE BEAMS ARE MINIMUM DEPTHS. CONTRACTOR MAY INCREASE DEPTHS TO ACCOMMODATE BLOCK COURSING; PROVIDE (1) #5 CONTINUOUS HORIZONTAL EACH FACE FOR EACH 8" INCREMENTAL INCREASE IN DEPTH.

ROOF SLAB

T1	#6 @ 8" O.C. BOTTOM (EACH WAY), AND #5 @ 12" O.C. TOP (EACH WAY)	SEE PLANS
T2	#5 "L" SHAPED DOWELS @ 12" O.C. TOP, ALL AROUND, 4'–0" SIDE ANCHORED INTO WALLS. SEE PLANS FOR REQUIRED EXTENSION LENGTH INTO SLAB	4'-0"
T3	#5 STRAIGHT BARS @ 12" O.C. TOP, SEE PLANS FOR REQUIRED EXTENSION LENGTH INTO SLAB	
T4	#4 "L" SHAPED DOWELS @ 8" O.C. TOP, ALL AROUND, 18" MIN. 90° HOOK LENGTH INTO BEAM. SEE PLANS FOR REQUIRED EXTENSION LENGTH INTO SLAB	
T5	#4 STRAIGHT BARS @ 8" O.C. TOP, SEE PLANS FOR REQUIRED EXTENSION LENGTH INTO SLAB	

LEGEND

- BAR JOIST TOP & BOTTOM CHORD DIAGONAL BRIDGING. SEE DETAILS 22 & 23, SHEET S013. (COORDINATE BRIDGING SHOW WITH SPECIFIC JOIST MANUFACTURER REQUIREMENTS AND NOTIFY EOR OF ANY DISCREPANCIES)
- BOTTOM CHORD UPLIFT BRIDGING. SEE DETAIL 21, SHEET S013. (COORDINATE BRIDGING SHOW WITH SPECIFIC JOIST MANUFACTURER REQUIREMENTS AND NOTIFY EOR OF ANY DISCREPANCIES)

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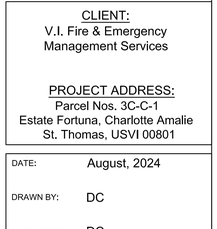
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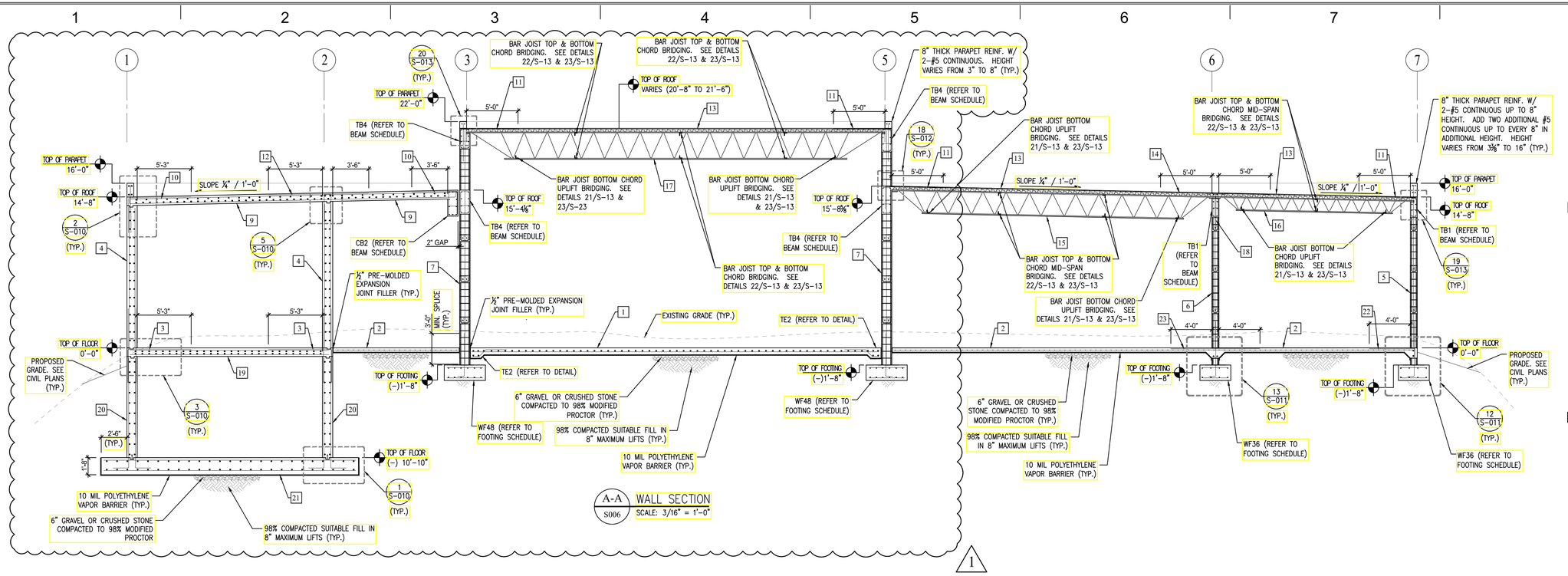
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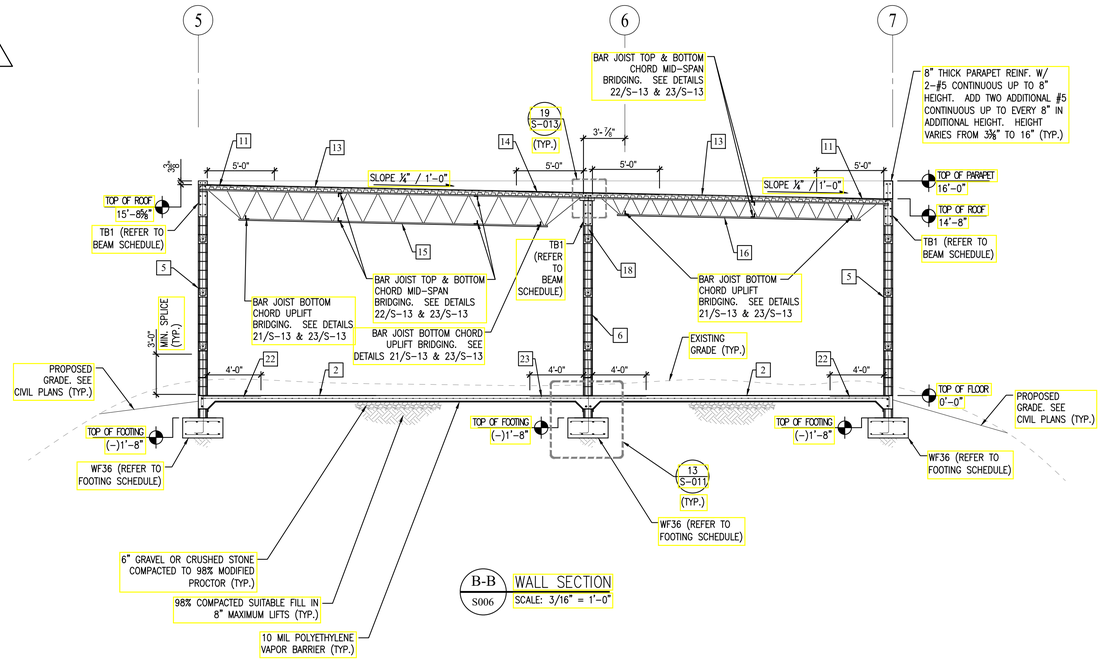
ROOF FRAMING PLAN





LEGEND

1. FLOOR SLAB IN APPARATUS BAYS SHALL BE 8" THICK 4000 PSI CONCRETE REINFORCED WITH #4 REBAR @ 8" O.C. EACH WAY. PLACE SLAB ON MIN. 10 MIL VAPOR BARRIER AND COMPACTED TERMITE TREATED SUBGRADE.
2. FLOOR SLAB IN OFFICES SHALL BE 5" THICK 4000 PSI CONCRETE REINFORCED WITH 6"X6" W2.9/W2.9 WELDED WIRE FABRIC. PLACE SLAB ON MIN. 10 MIL VAPOR BARRIER AND COMPACTED TERMITE TREATED SUBGRADE.
3. #5 "L" SHAPED DOWELS @ 8" O.C. TOP, ALL AROUND, 4'-0" SIDE ANCHORED INTO CISTERN WALLS (6'-0" / 4'-0")
4. 12" POURED CONCRETE WALL REINFORCED WITH 1-#6 VERTICAL REINF. @ 10" O.C. AND 1-#5 HORIZONTAL REINFORCEMENT @ 10" O.C., BOTH FACES.
5. 8" C.M.U. WALL REINFORCED WITH 1-#6 VERTICAL REINF. @ 8" O.C. IN FULLY GROUTED CELL, DURO-WALL HORIZONTAL JOINT REINF. @ 16" O.C., AND HORIZONTAL BOND BEAM EVERY 4'-0" O.C. REINF. WITH 1-#4 CONTINUOUS
6. 8" C.M.U. WALL REINFORCED WITH 1-#5 VERTICAL REINF. @ 8" O.C. IN FULLY GROUTED CELL, DURO-WALL HORIZONTAL JOINT REINF. @ 16" O.C., AND HORIZONTAL BOND BEAM EVERY 4'-0" O.C. REINF. WITH 1-#4 CONTINUOUS
7. 12" C.M.U. WALL REINFORCED WITH 1-#6 VERTICAL REINF. @ 8" O.C. IN FULLY GROUTED CELL, DURO-WALL HORIZONTAL JOINT REINF. @ 16" O.C., AND HORIZONTAL BOND BEAM EVERY 4'-0" O.C. REINF. WITH 2-#5 CONTINUOUS
8. 8" C.M.U. WALL REINFORCED WITH 1-#5 VERTICAL REINF. @ 48" O.C. IN FULLY GROUTED CELL AND DURO-WALL HORIZONTAL JOINT REINF. @ 16" O.C.
9. 10" THICK 4,000 PSI CONCRETE SLAB REINFORCED WITH #6 @ 8" O.C. BOTTOM EACH WAY, & #5 @ 12" O.C. EACH WAY TOP.
10. #5 "L" SHAPED DOWELS @ 12" O.C. TOP, ALL AROUND, 4'-0" SIDE ANCHORED INTO WALLS. SEE PLANS FOR REQUIRED EXTENSION LENGTH INTO SLAB (SEE PLANS / 4'-0")
11. #4 "L" SHAPED DOWELS @ 8" O.C. TOP, ALL AROUND, 18" MIN. 90° HOOK LENGTH INTO BEAM. SEE PLANS FOR REQUIRED EXTENSION LENGTH INTO SLAB (SEE PLANS / 1'-6")
12. #5 STRAIGHT BARS @ 12" O.C. TOP, SEE PLANS FOR REQUIRED EXTENSION LENGTH INTO SLAB
13. 4½" TOTAL DEPTH CONCRETE (4000 PSI) SLAB REINF. W/ 6"X6" W2.9 X W2.9 WELDED WIRE FABRIC ON 20GA. NON-COMPOSITE 2C (2-INCH) ROOF DECK
14. #4 STRAIGHT BARS @ 8" O.C. TOP, SEE PLANS FOR REQUIRED EXTENSION LENGTH INTO SLAB
15. NEW MILLENNIUM 26K8 BAR JOIST OR APPROVED EQUAL SPACED @ 5'-0" O.C.
FACTORED DL + LL = 442 LB/LF
FACTORED LL = 160 LB/LF
NET UPLIFT = 156 LB/FT
16. NEW MILLENNIUM 16K4 BAR JOIST OR APPROVED EQUAL SPACED @ 5'-0" O.C.
FACTORED DL + LL = 439 LB/LF
FACTORED LL = 160 LB/LF
NET UPLIFT = 159 LB/FT
17. NEW MILLENNIUM 32LH06 BAR JOIST OR APPROVED EQUAL SPACED @ 5'-0" O.C.
FACTORED DL + LL = 460 LB/LF
FACTORED LL = 166 LB/LF
NET UPLIFT = 160 LB/FT
18. #5 @ 8" O.C., WITH ACI STANDARD 90° HOOK AT DISCONTINUOUS END INTO SLAB. ALTERNATE HOOK PLACEMENT SIDE. SPLICE LENGTH IN WALL SHALL BE 30" MIN.
19. 10" THICK 5,000 PSI CONCRETE SLAB REINFORCED #8 @ 6" O.C. BOTTOM (SHORT SPAN), AND #5 @ 8" O.C. TOP (SHORT SPAN)
#6 @ 8" O.C. BOTTOM, TEMP. & SHRINKAGE (LONG SPAN); & #5 @ 8" O.C. TOP, TEMP. & SHRINKAGE (LONG SPAN)
20. 12" THICK 4,000 PSI CONCRETE WALL REINFORCED WITH #6 @ 8" O.C. VERTICAL, AND #5 @ 8" O.C. HORIZONTAL, EACH FACE
21. 20" THICK 4,000 PSI CONCRETE SLAB REINFORCED WITH #6 @ 8" O.C. (SHORT SPAN), AND #5 @ 8" O.C. (LONG SPAN), TOP & BOTTOM
22. #4 "L" SHAPED DOWELS @ 12" O.C. TOP, ALL AROUND, 12" MIN. 90° HOOK LENGTH INTO THICKENED EDGE. SEE PLANS FOR REQUIRED EXTENSION LENGTH INTO SLAB ON GRADE (SEE PLANS / 1'-0")
23. #4 STRAIGHT BARS @ 12" O.C. TOP, SEE PLANS FOR REQUIRED EXTENSION LENGTH INTO SLAB ON GRADE



REVISIONS		
NO.	DATE	REMARKS
1	08-22-25	REVISIONS

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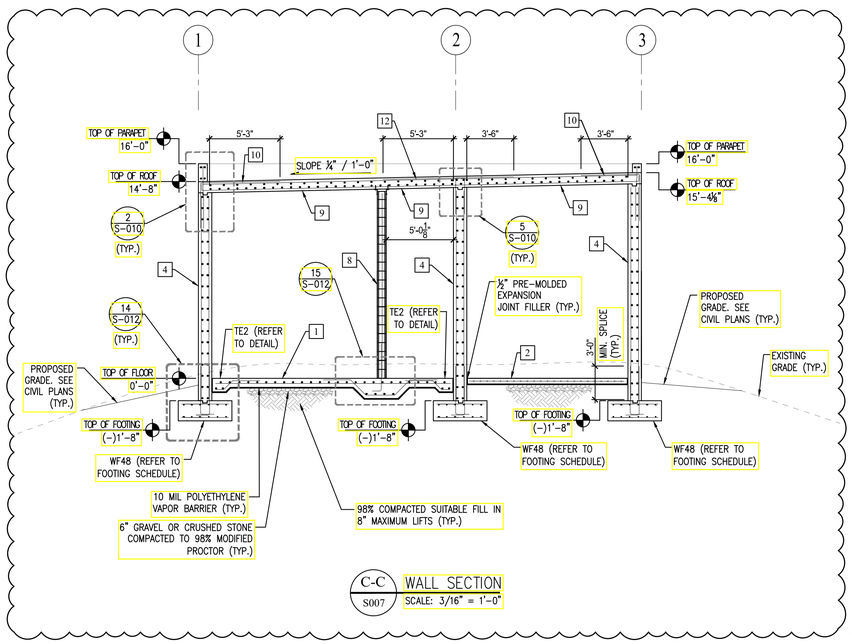
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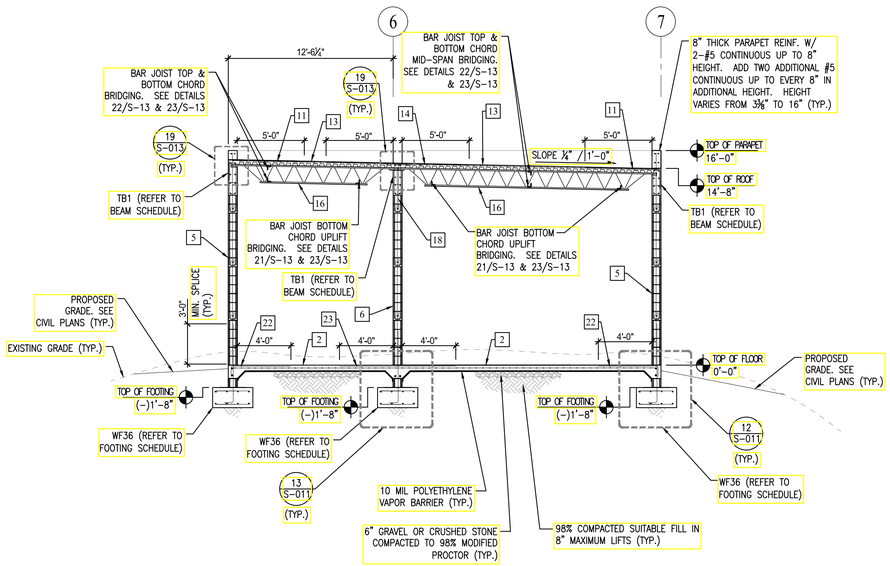
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WALL SECTIONS

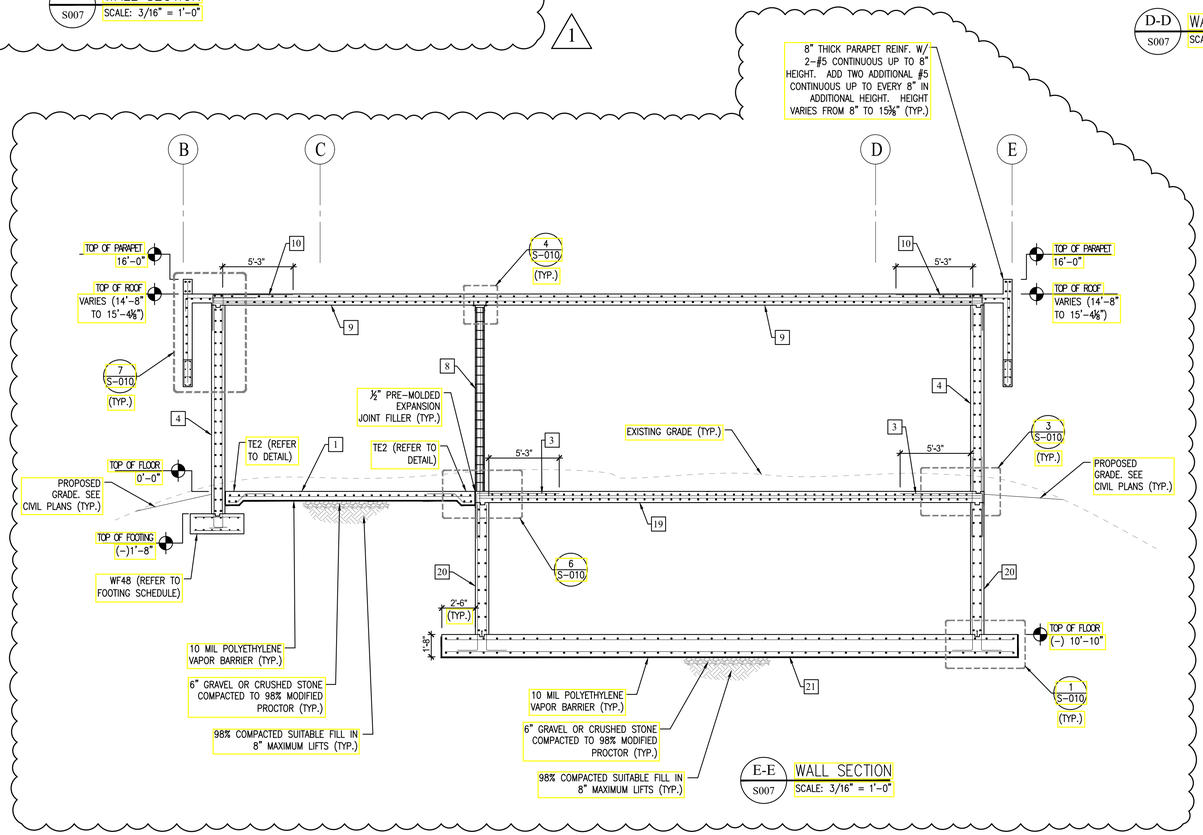




C-C S007 WALL SECTION
SCALE: 3/16" = 1'-0"



D-D S007 WALL SECTION
SCALE: 3/16" = 1'-0"



E-E S007 WALL SECTION
SCALE: 3/16" = 1'-0"

NOTES

1. REFER TO LEGEND ON SHEET S006

REVISIONS

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1	08-22-25	REVISIONS

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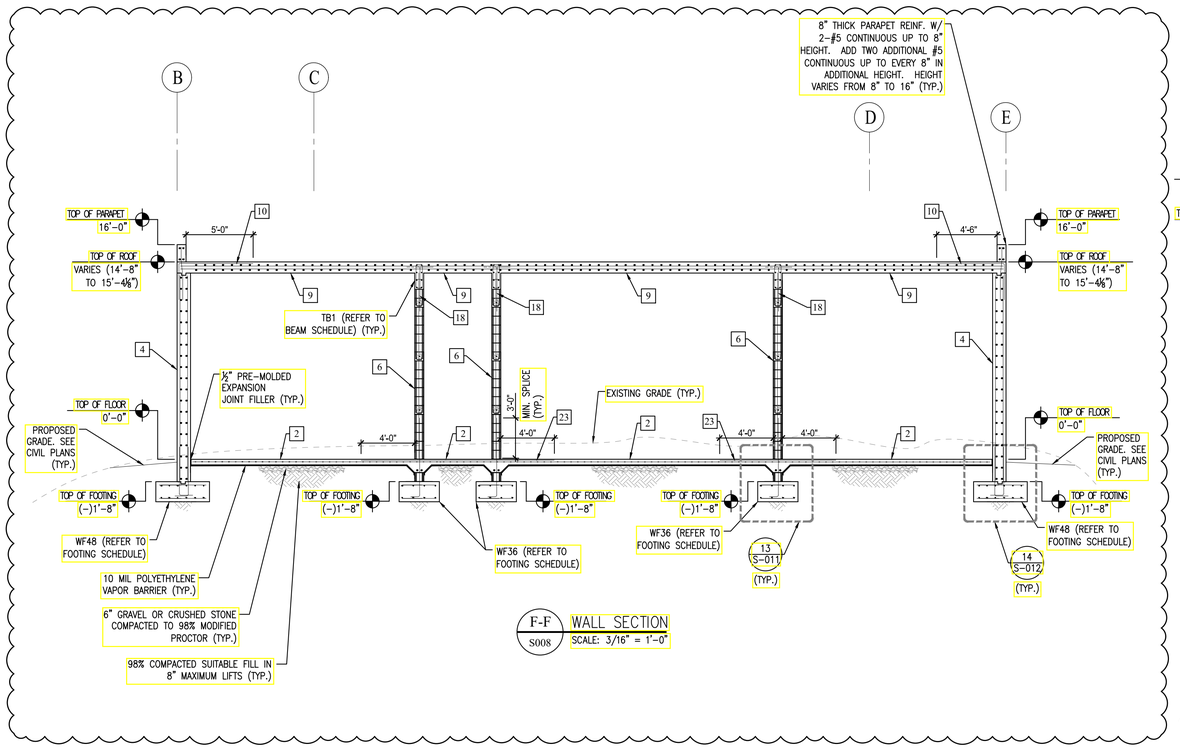
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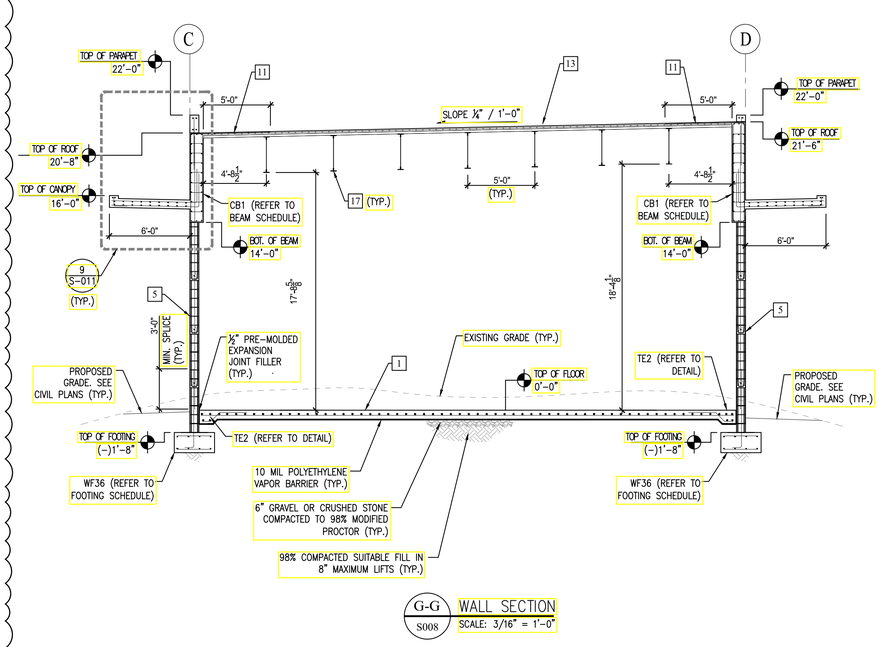
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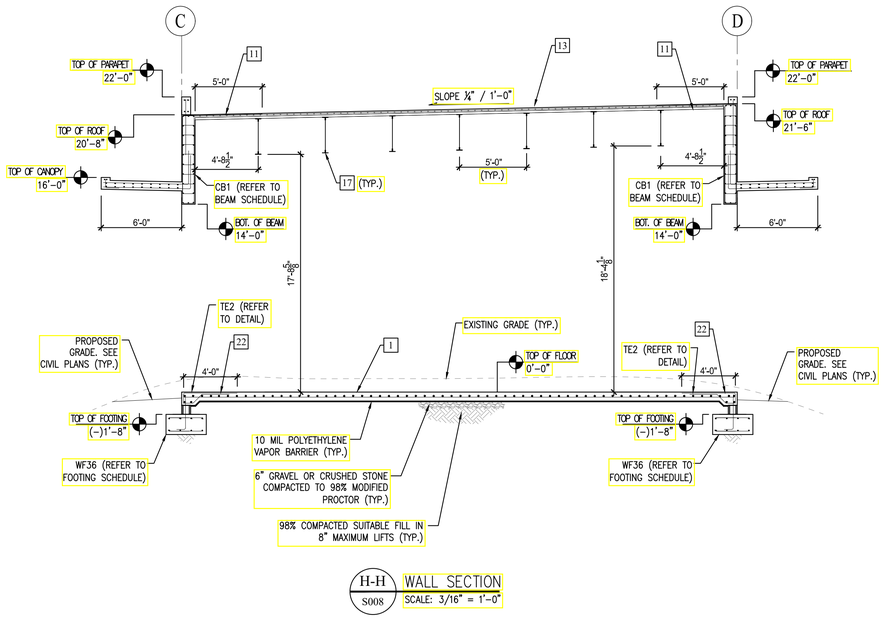
SHEET NO.: S007

WALL SECTIONS









NOTES

1. REFER TO LEGEND ON SHEET S006

REVISIONS

NO.	DATE	REMARKS
1	08-22-25	REVISIONS

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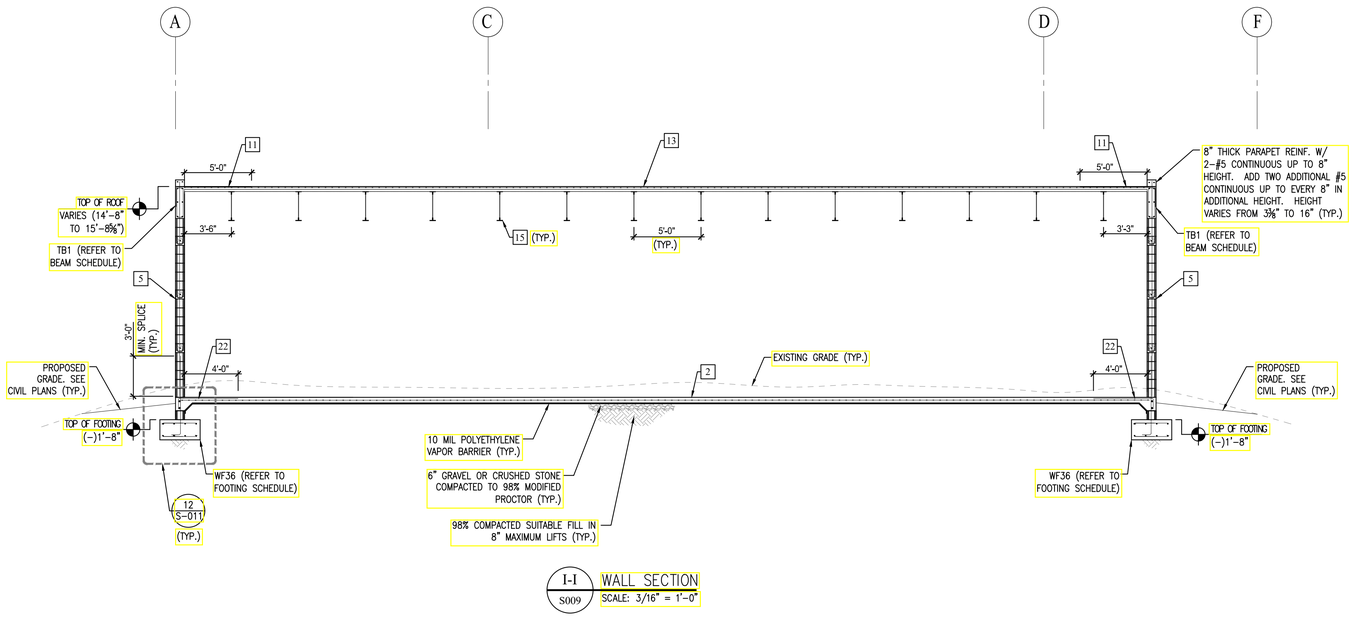
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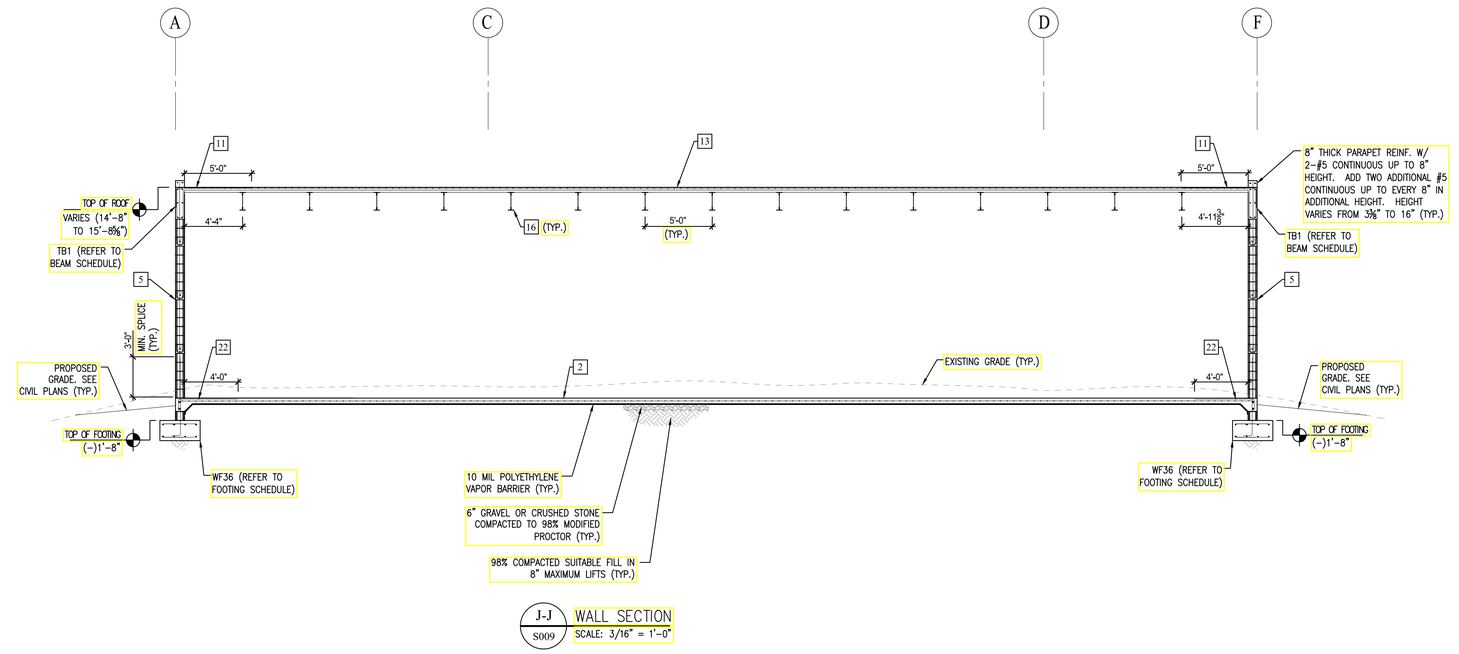
SHEET NO.: S008

WALL SECTIONS

PROFESSIONAL ENGINEER DAMIAN CARTWRIGHT 28851-18 U.S. VIRGIN ISLANDS



I-I / S009 WALL SECTION
SCALE: 3/16" = 1'-0"



J-J / S009 WALL SECTION
SCALE: 3/16" = 1'-0"

NOTES

1. REFER TO LEGEND ON SHEET S006

REVISIONS

NO.	DATE	REMARKS

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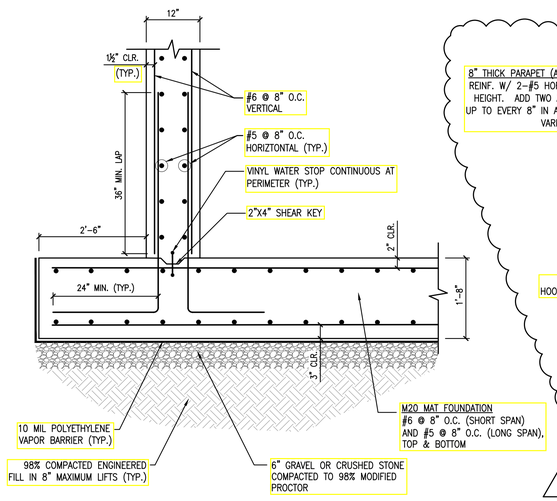
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PROJECT NO.:
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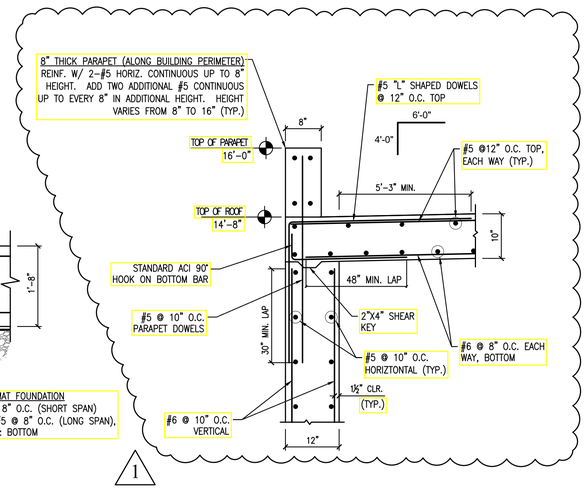
WALL SECTIONS





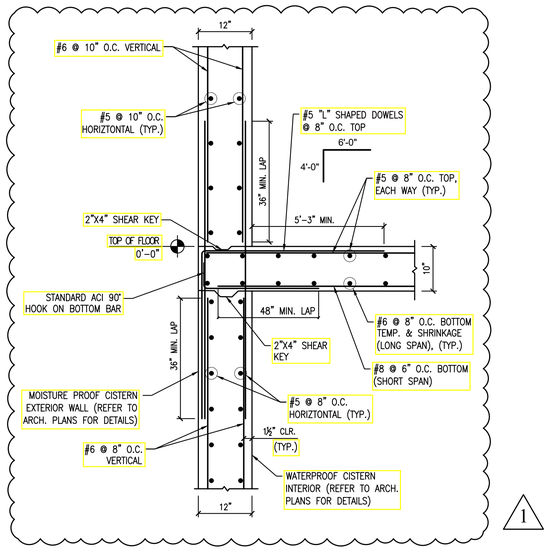
1 CISTERN MAT FOUNDATION TO WALL CONNECTION

SCALE: N.T.S.



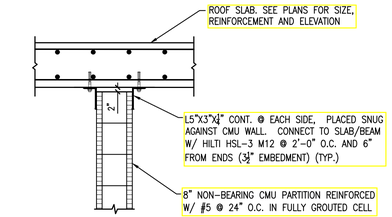
2 SAFE ROOM WALL TO ROOF SLAB CONNECTION

SCALE: N.T.S.



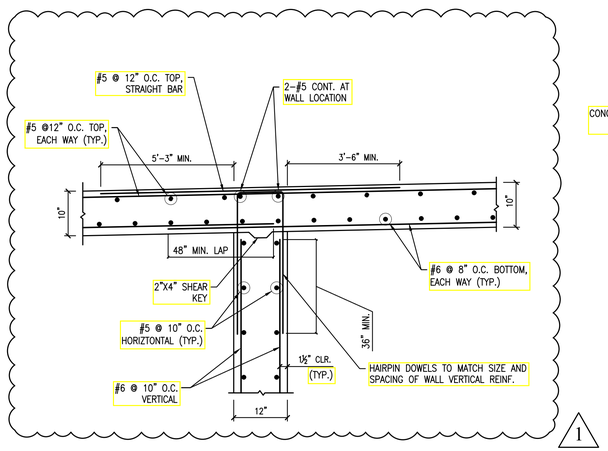
3 CISTERN WALL/CISTERN TOP SLAB/SAFE ROOM WALL CONNECTION

SCALE: N.T.S.



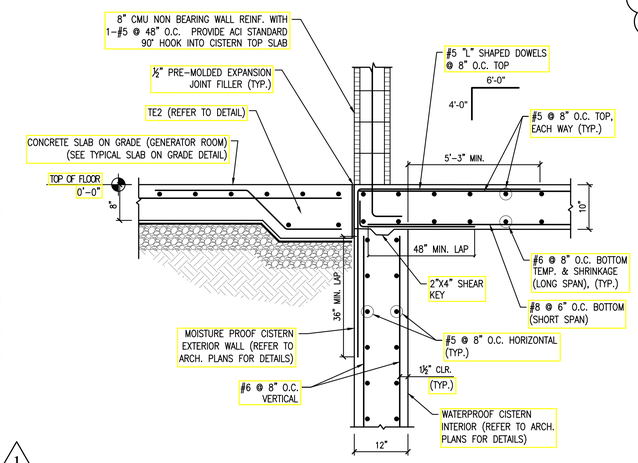
4 NON BEARING CMU PARTITION CONNECTION TO UNDERSIDE OF ROOF SLAB

SCALE: N.T.S.



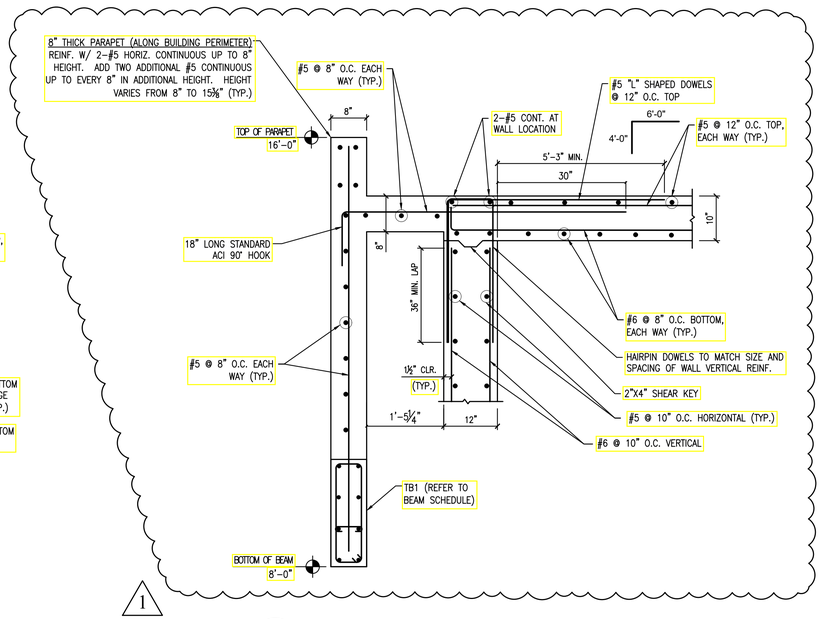
5 SAFE ROOM WALL TO ROOF SLAB CONNECTION AT ADJACENT ROOF

SCALE: N.T.S.



6 CISTERN WALL/CISTERN TOP SLAB/NON-BEARING CMU PARTITION

SCALE: N.T.S.



7 SAFE ROOM ALCOVE CANTILEVER

SCALE: N.T.S.

REVISIONS

NO.	DATE	REMARKS
1	08-22-25	REVISIONS

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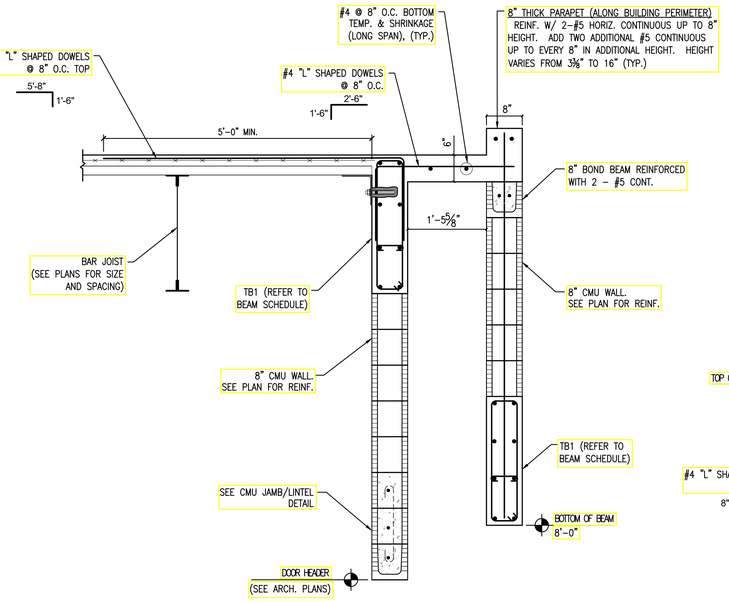
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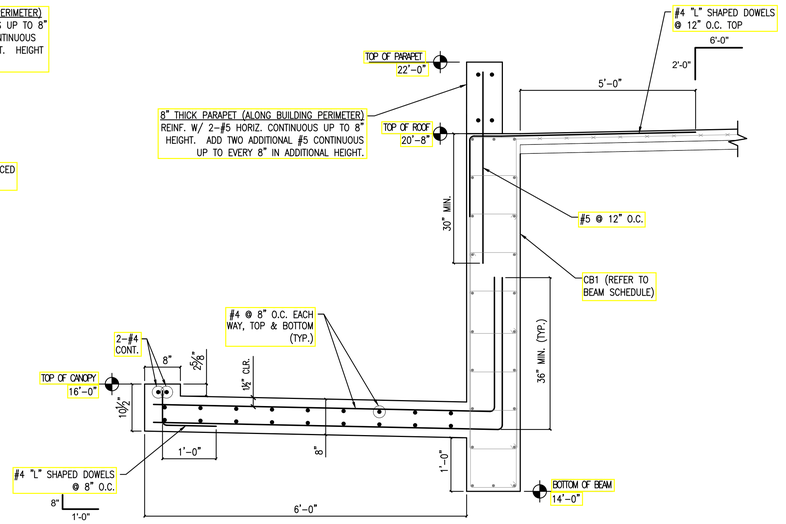
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STRUCTURAL DETAILS

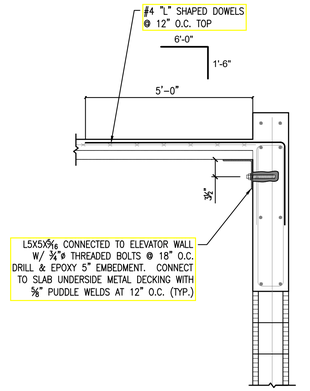
PROFESSIONAL ENGINEER
DAMIAN CARTWRIGHT
20851 - 18
VIRGIN ISLANDS



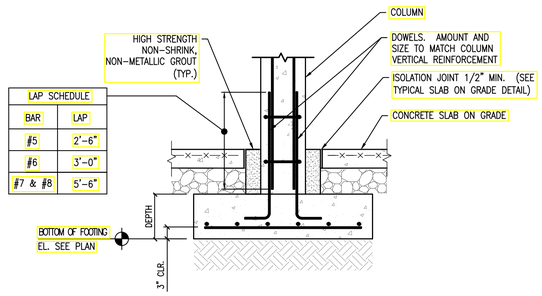
8 ALCOVE CANTILEVER
SCALE: N.T.S.



9 ALCOVE CANTILEVER
SCALE: N.T.S.



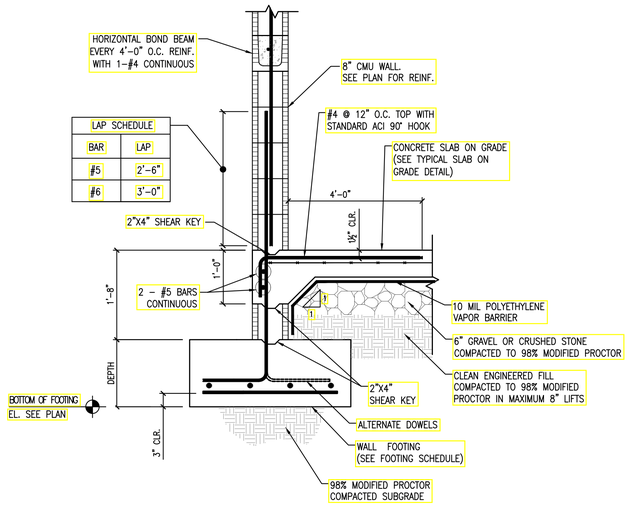
10 COMPOSITE ROOF DECK CONNECTION TO TIE BEAM
SCALE: N.T.S.



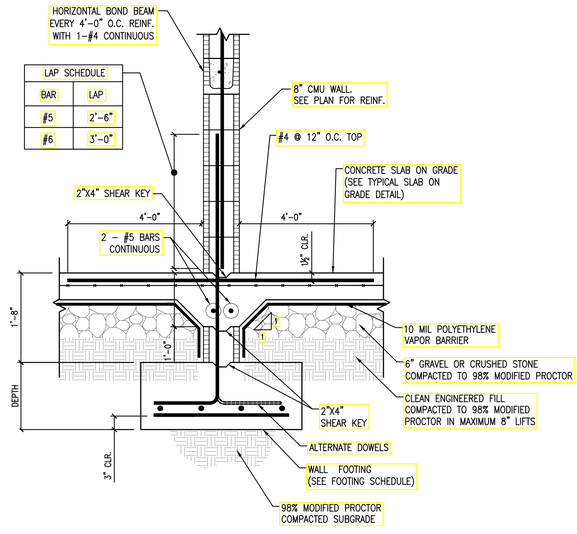
NOTES:

1. FOOTINGS SHALL BEAR ON FIRM UNDISTURBED SOIL WITH A MINIMUM BEARING CAPACITY AS SPECIFIED IN THE GENERAL NOTES.
2. FOR SIZE, DEPTH AND REINFORCING SEE FOOTING SCHEDULE.

11 TYPICAL SPREAD FOOTING AT CONCRETE COLUMN
SCALE: N.T.S.



12 TYPICAL STRIP FOOTING PERIMETER CMU WALL CONNECTION
SCALE: N.T.S.



13 TYPICAL STRIP FOOTING INTERIOR CMU WALL CONNECTION
SCALE: N.T.S.

REVISIONS

NO.	DATE	REMARKS

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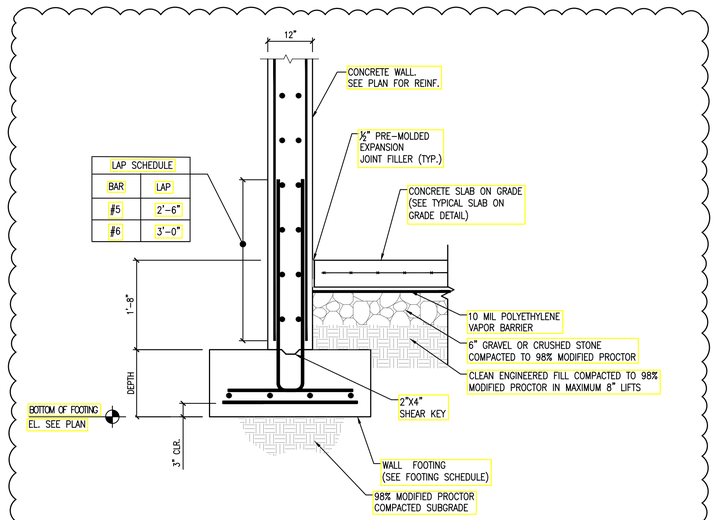
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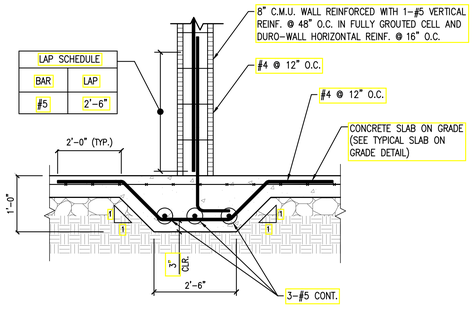
STRUCTURAL DETAILS





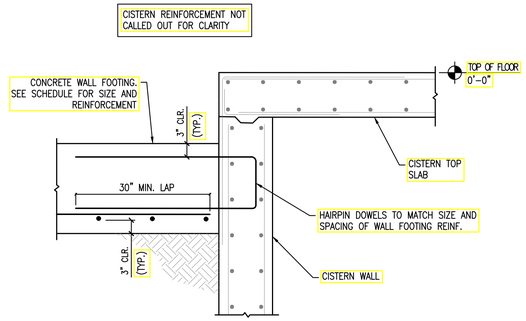
14 TYPICAL STRIP FOOTING SAFE ROOM CONCRETE WALL CONNECTION

SCALE: N.T.S.



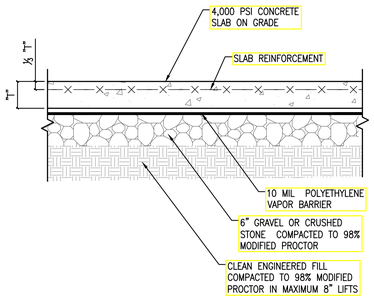
15 MASONRY NON BEARING PARTITIONS AT SLAB ON GRADE (WF30)

SCALE: N.T.S.



16 WALL FOOTING TIE-IN TO CISTERN WALL

SCALE: N.T.S.



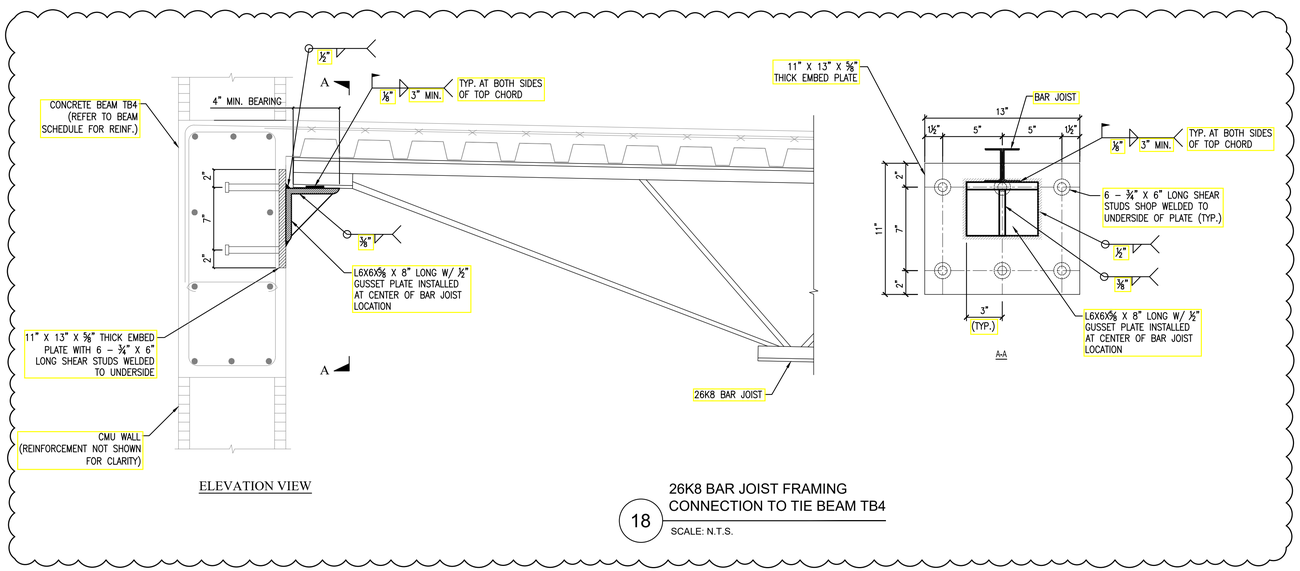
NOTES:

1. SLAB ON GRADE SHALL BE PLACED IN ALTERNATING STRIPS WHERE EACH SINGLE STRIP DOES NO EXCEED 36 TIMES SLAB THICKNESS WIDTH IN INCHES. ALTERNATIVELY, LARGE BLOCK PLACEMENTS WITH INTERIOR CONTRACTION JOINTS ARE ACCEPTABLE IF THE CONTRACTION JOINTS ARE MADE IN BOTH DIRECTIONS AT SPECIFIED INTERVALS IN A TIMELY MANNER.
2. SAWED CONTRACTION JOINTS SHALL BE LOCATED AT A MAXIMUM SPACING IN INCHES OF 36 TIMES THE SLAB THICKNESS. JOINTS SHALL BE SAWED NO LATER THAN 24 HOURS AFTER CONCRETE IS PLACED.
3. GRAVEL OR CRUSHED STONE BASE SHALL BE COMPACTED TO 98% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT.

SLAB THICKNESS "t"	SLAB REINFORCEMENT	SLAB LOCATION
5"	6"X6" W2.9/W2.9	EVERYWHERE EXCEPT APPARATUS BAYS AND GENERATOR ROOM
8"	#5 @ 8" O.C., EACH WAY	APPARATUS BAYS AND GENERATOR ROOM

17 TYPICAL SLAB ON GRADE

SCALE: N.T.S.



18 26K8 BAR JOIST FRAMING CONNECTION TO TIE BEAM TB4

SCALE: N.T.S.

REVISIONS

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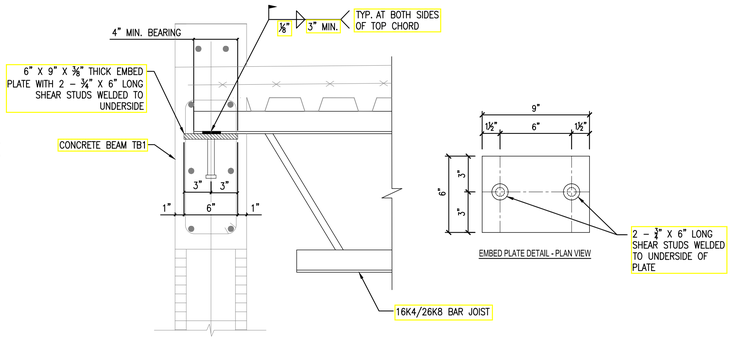
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SHEET NO.: S012

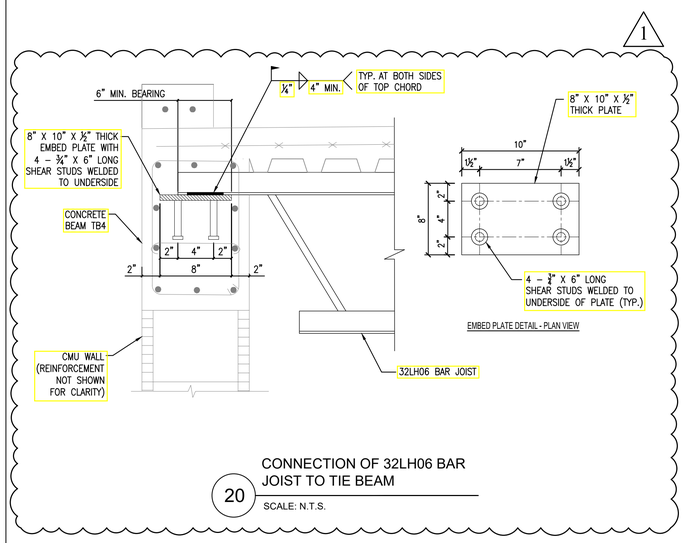
STRUCTURAL DETAILS

PROFESSIONAL ENGINEER
DAMIAN CARTWRIGHT
29851-18
REGISTERED



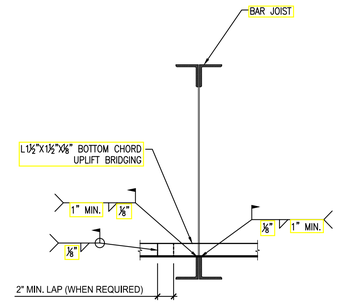
19 CONNECTION OF 16K4/26K8 BAR JOIST TO TIE BEAM

SCALE: N.T.S.



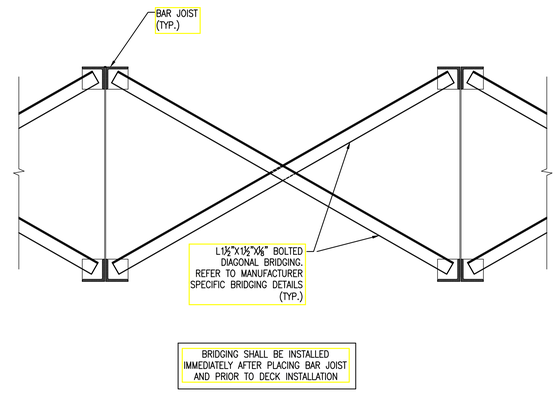
20 CONNECTION OF 32LH06 BAR JOIST TO TIE BEAM

SCALE: N.T.S.



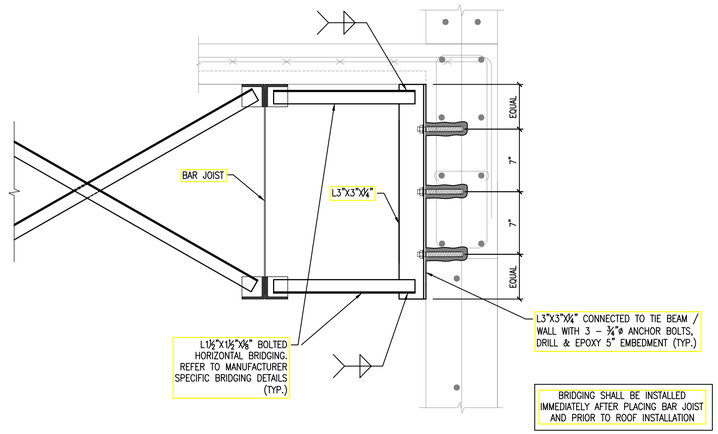
21 BAR JOIST UPLIFT BRIDGING

SCALE: N.T.S.



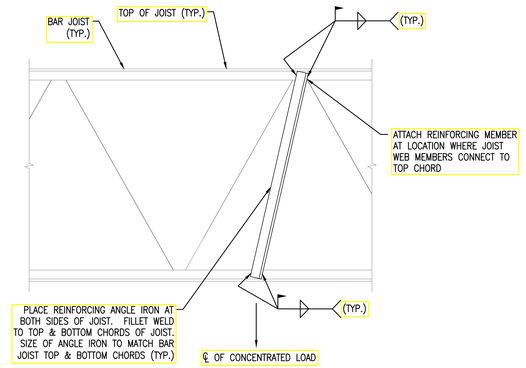
22 BAR JOIST BOLTED DIAGONAL BRIDGING

SCALE: N.T.S.



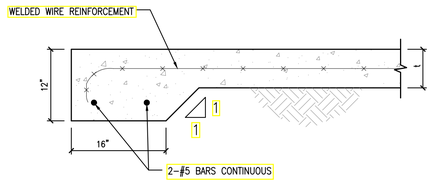
23 BAR JOIST BRIDGING CONNECTION TO WALL

SCALE: N.T.S.



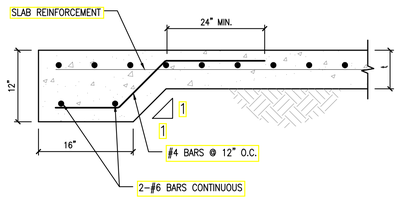
24 BAR JOIST REINFORCEMENT FOR SUSPENDED FANS

SCALE: N.T.S.



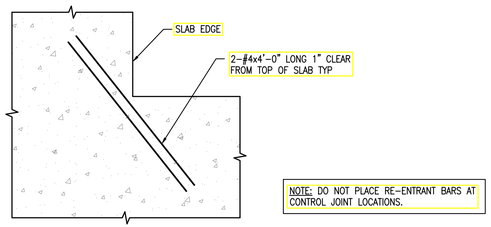
25 TE1 - TYPICAL SECTION THRU THICKENED CONCRETE EDGE (SEE PLANS FOR LOCATIONS)

SCALE: N.T.S.



26 TE2 - TYPICAL SECTION THRU THICKENED CONCRETE EDGE (SEE PLANS FOR LOCATIONS)

SCALE: N.T.S.



27 EXTRA REINFORCING AT RE-ENTRANT CORNERS OF SLAB-ON-GRADE

SCALE: N.T.S.

REVISIONS

NO.	DATE	REMARKS
1	08-22-25	REVISIONS

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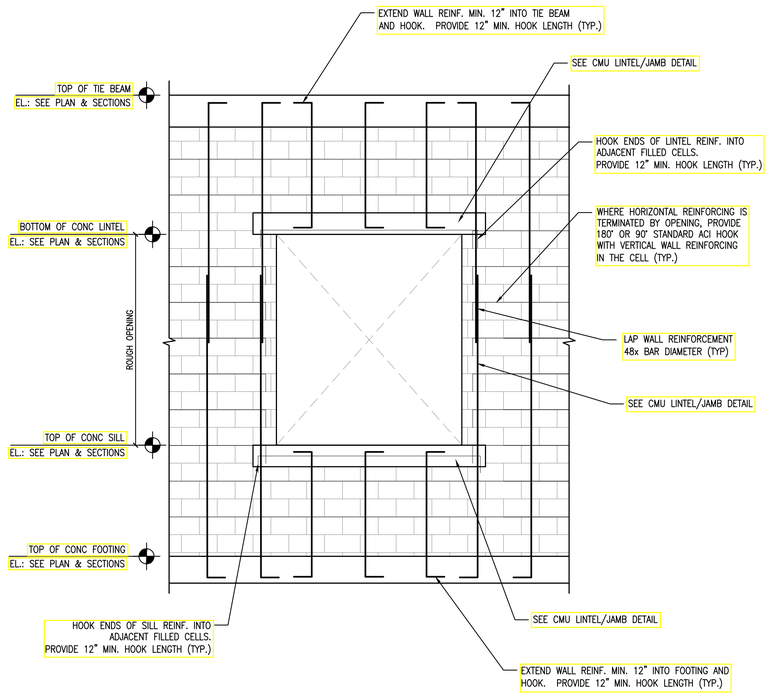
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APPROVED BY: DC

PROJECT NO.:
CONTRACT NO.:

SHEET NO.: S013

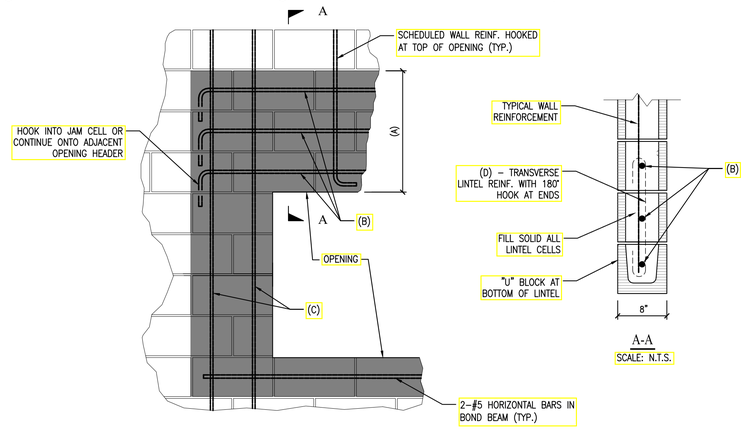
STRUCTURAL DETAILS





28 TYPICAL WALL OPENING REINFORCEMENT (CMU WALL)

SCALE: N.T.S.



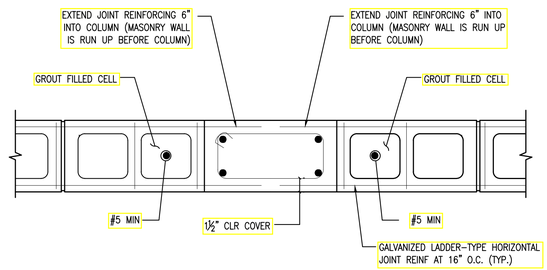
CMU LINTEL/JAMB SCHEDULE					
MAX. OPENING WIDTH	CMU WIDTH	(A) - MIN. DEPTH OF FULLY GROUTED CELLS	(B) HORIZONTAL BOTTOM REINF.	(C) MINIMUM ADJACENT FULLY GROUTED CELLS AND REINF. (1 VERT.) PER CELL U.N.O.	(D) TRANSVERSE REINFORCEMENT
≤ 4'-0"	8"	8"	(1) #5 BOTTOM	ONE 8" CELL W/ 1-REBAR (REBAR SIZE TO MATCH WALL REBAR SCHEDULE, #5 MIN.)	NOT REQUIRED
4'-0"< OPENING ≤ 6'-0"	8"	16"	(1) #5 BOTTOM	TWO 8" CELLS W/ 1-REBAR EACH (REBAR SIZE TO MATCH WALL REBAR SCHEDULE, #5 MIN.)	#5 AT ENDS ONLY
6'-0"< OPENING ≤ 8'-0"	8"	24"	(1) #5 BOTTOM	TWO 8" CELLS W/ 1-REBAR EACH (REBAR SIZE TO MATCH WALL REBAR SCHEDULE, #6 MIN.)	#5 AT ENDS & 24" O.C.
8'-0"< OPENING ≤ 10'-0"	8"	32"	(2) #5 BOTTOM	TWO 8" CELLS W/ 1-REBAR EACH (REBAR SIZE TO MATCH WALL REBAR SCHEDULE, #6 MIN.)	#5 AT ENDS & 24" O.C.

NOTES:

1. VERIFY ALL CMU OPENINGS W/ ARCHITECT DWG'S.
2. ALL CMU LINTEL BEAMS ABOVE BOTTOM COURSE OPEN BOTTOM LINTEL UNITS, OR STRETCHER SHALL BE CONSTRUCTED OF COURSES WITH 1/2 WEB CUT OUT.
3. COORDINATE WITH SECTIONS, DETAILS, & GENERAL NOTES.

29 CMU LINTEL / JAMB DETAIL

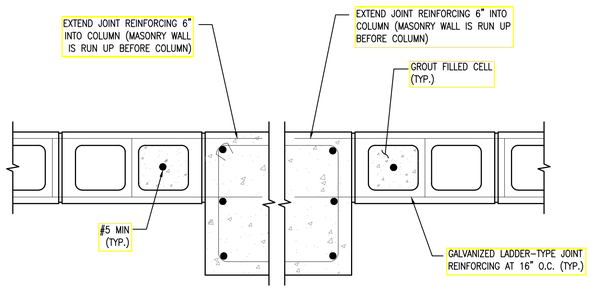
SCALE: N.T.S.



#4 BOND BEAM REBAR SHALL PASS CONTINUOUS THROUGH TIE COLUMN

30 TIE COLUMN ANCHORAGE DETAIL

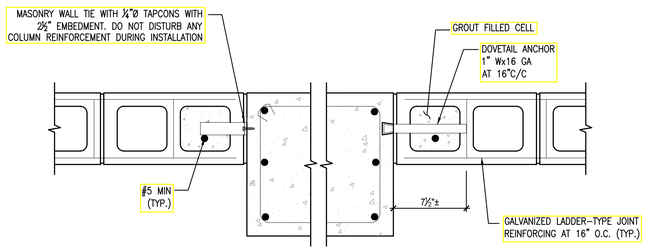
SCALE: N.T.S.



#4 BOND BEAM REBAR SHALL PASS CONTINUOUS THROUGH COLUMN

31 STRUCTURAL COLUMN ANCHORAGE DETAIL (PREFERRED METHOD)

SCALE: N.T.S.



#4 BOND BEAM REBAR SHALL PASS CONTINUOUS THROUGH COLUMN

32 STRUCTURAL COLUMN ANCHORAGE DETAIL (ALTERNATE METHOD)

SCALE: N.T.S.

REVISIONS

NO.	DATE	REMARKS

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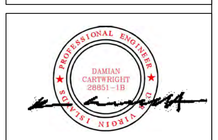
PROJECT ADDRESS:
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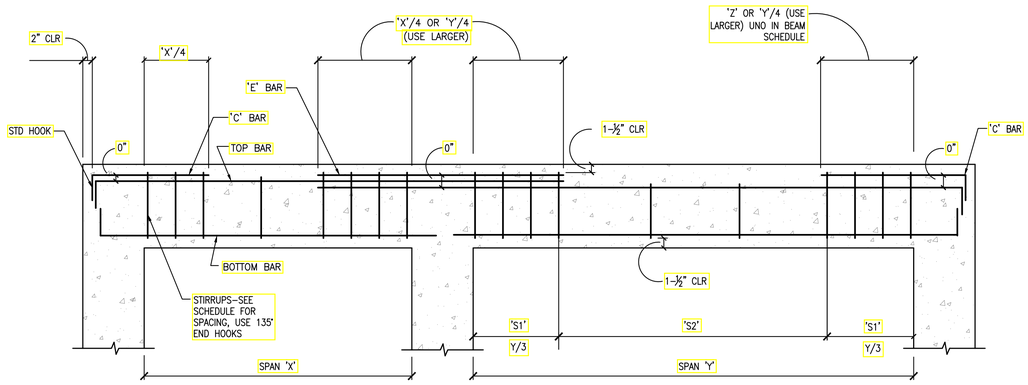
DATE: August, 2024
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PROJECT NO.:
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SHEET NO.: S014

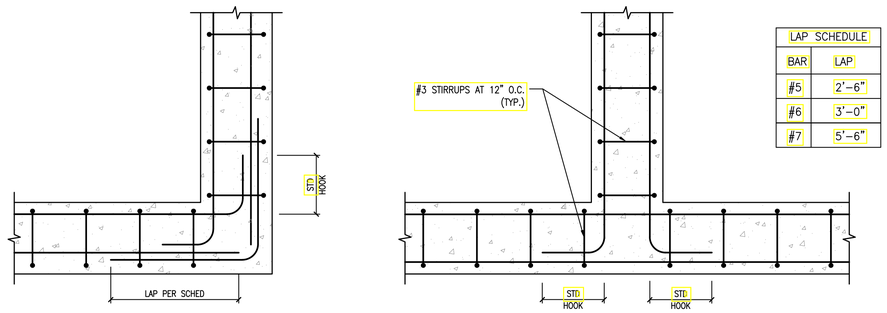
STRUCTURAL DETAILS





33 TYPICAL BENDING DIAGRAM FOR BEAMS & SLABS

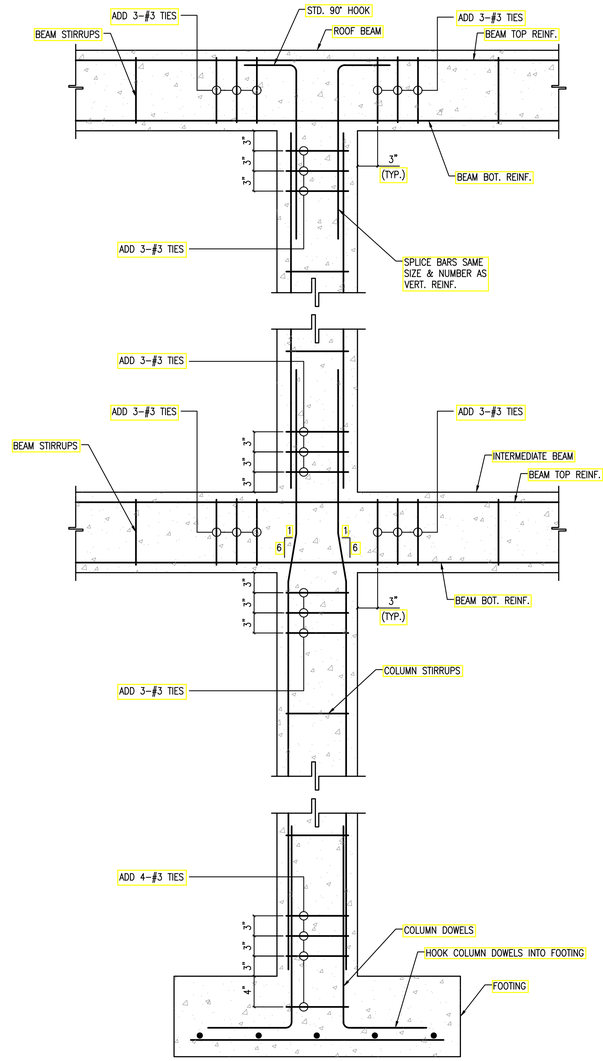
SCALE: N.T.S.



LAP SCHEDULE	
BAR	LAP
#5	2'-6"
#6	3'-0"
#7	5'-6"

34 TIE BEAM CORNER DETAILS (PLAN VIEW)

SCALE: N.T.S.



35 TYPICAL FOOTING/COLUMN/BEAM INTERFACE

SCALE: N.T.S.

REVISIONS

NO.	DATE	REMARKS

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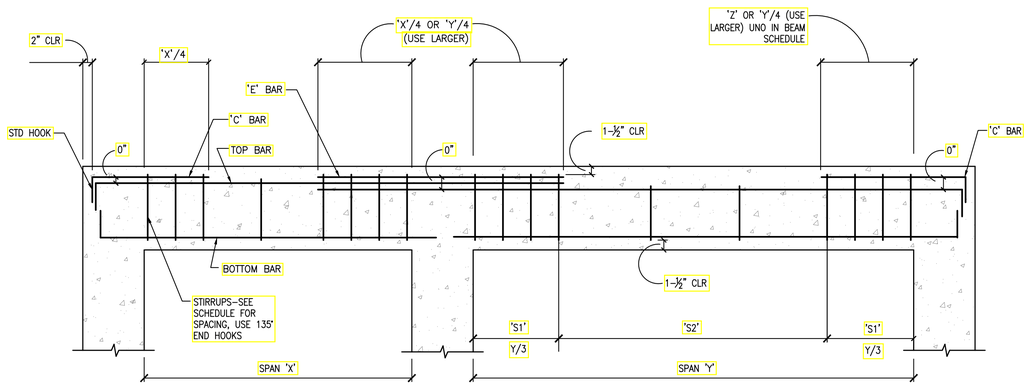
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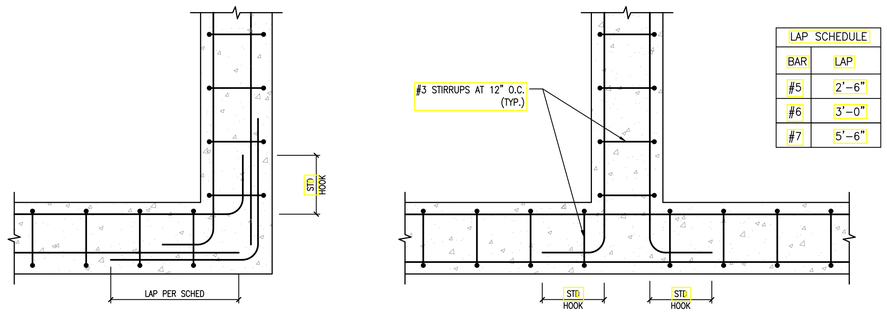
STRUCTURAL DETAILS

PROFESSIONAL ENGINEER
DAMIAN CARTWRIGHT
29851-19
U.S. VIRGIN ISLANDS



33 TYPICAL BENDING DIAGRAM FOR BEAMS & SLABS

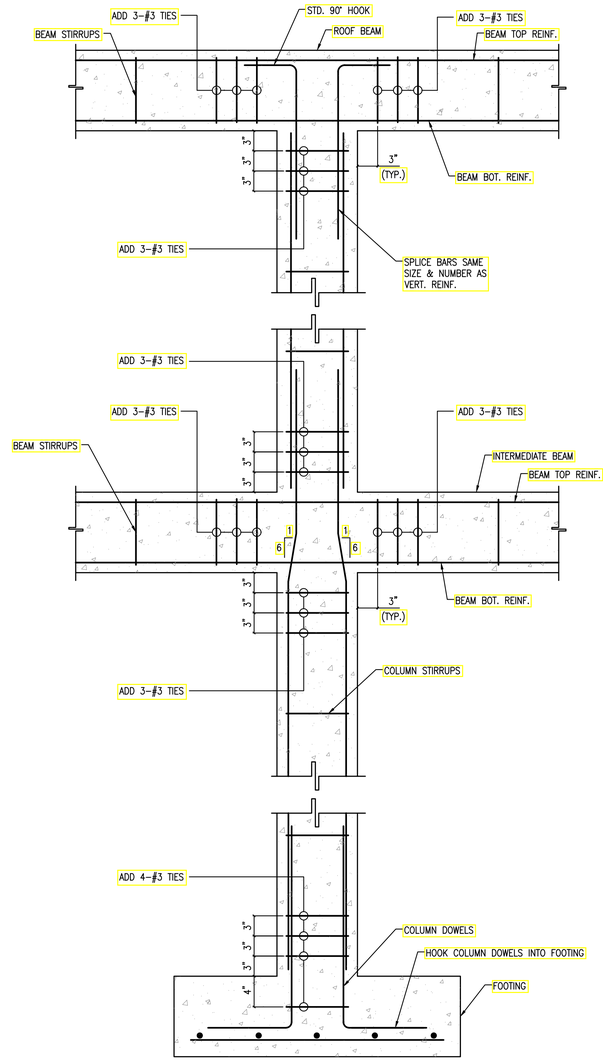
SCALE: N.T.S.



LAP SCHEDULE	
BAR	LAP
#5	2'-6"
#6	3'-0"
#7	5'-6"

34 TIE BEAM CORNER DETAILS (PLAN VIEW)

SCALE: N.T.S.



35 TYPICAL FOOTING/COLUMN/BEAM INTERFACE

SCALE: N.T.S.

REVISIONS

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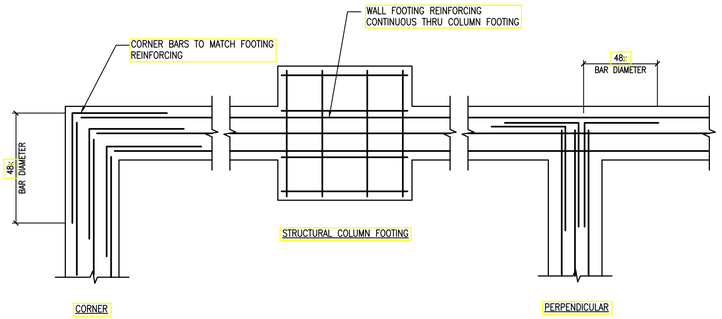
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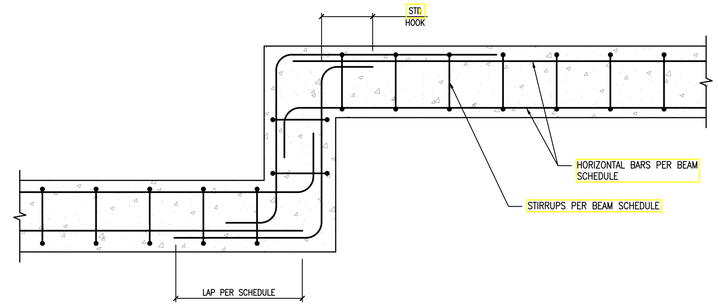
STRUCTURAL DETAILS

PROFESSIONAL ENGINEER
DAMIAN CARTWRIGHT
28851-15
REGISTERED



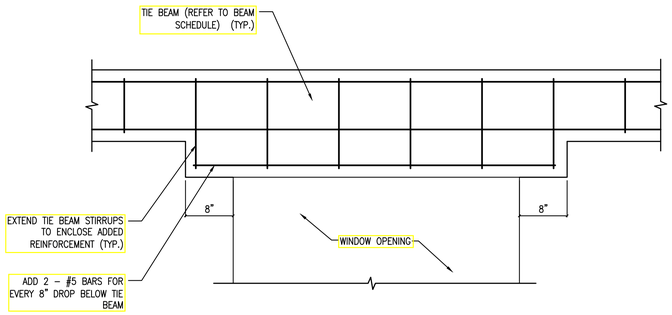
36 TYPICAL FOOTING INTERSECTION DETAIL

SCALE: N.T.S.



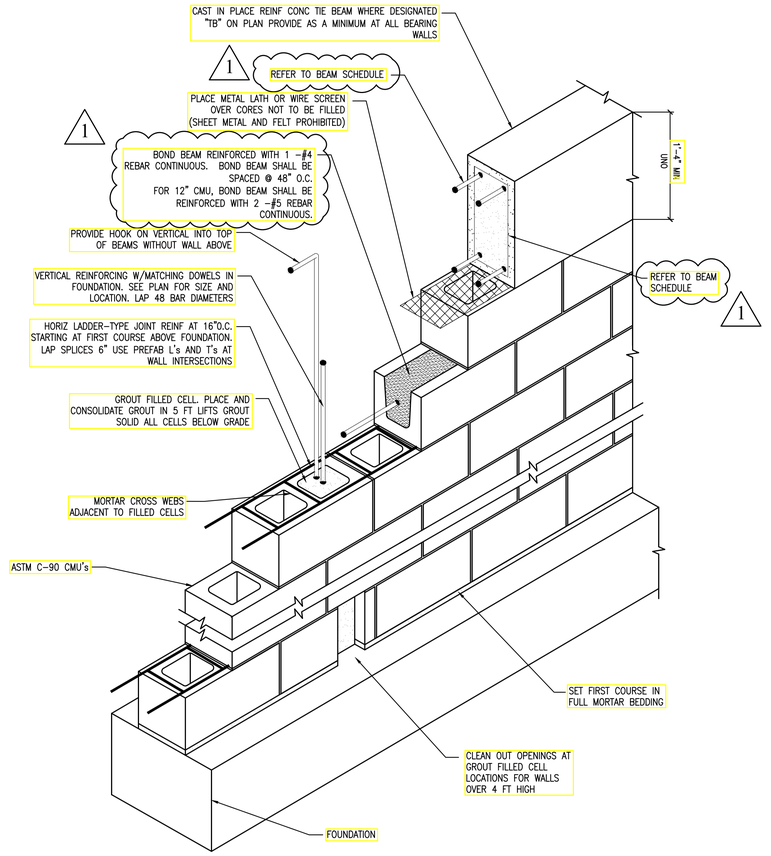
37 TYPICAL TIE BEAM REINFORCEMENT DETAIL (PLAN VIEW)

SCALE: N.T.S.



38 TIE BEAM DROP OVER WINDOW OPENINGS

SCALE: N.T.S.



TYPICAL MASONRY WALL CONSTRUCTION

39 TYPICAL MASONRY WALL CONSTRUCTION DETAIL FOR RUNNING BOND LAYOUT

SCALE: N.T.S.

REVISIONS

NO.	DATE	REMARKS
1	08-22-25	REVISIONS

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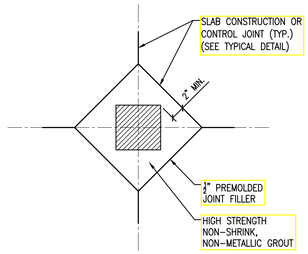
PROJECT NO.:

CONTRACT NO.:

SHEET NO.: S017

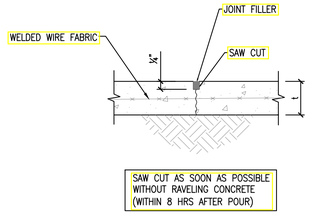
STRUCTURAL DETAILS





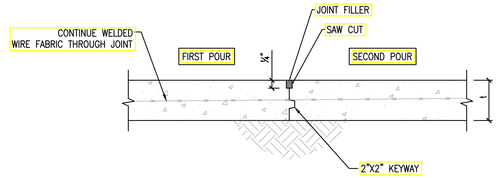
40 TYPICAL ISOLATION JOINTS AT COLUMN

SCALE: N.T.S.



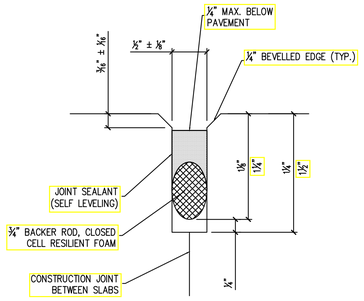
41 TYPICAL CONTROL JOINT DETAIL

SCALE: N.T.S.



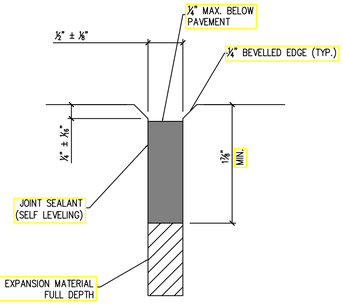
42 TYPICAL CONSTRUCTION JOINT

SCALE: N.T.S.



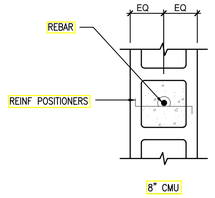
43 TYPICAL CONSTRUCTION/CONTROL JOINT SEALANT

SCALE: N.T.S.



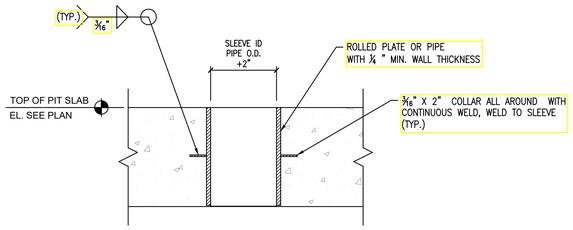
44 TYPICAL EXPANSION/ISOLATION JOINT SEALANT

SCALE: N.T.S.



45 TYPICAL VERTICAL REINFORCING IN WALL DETAIL

SCALE: N.T.S.

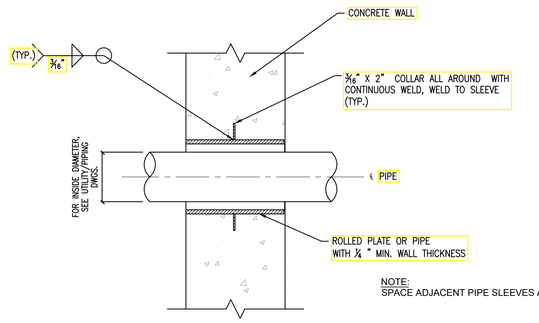


NOTE: PROVIDE CLEAR SPACE BETWEEN PIPE AND/ OR OPENINGS A MINIMUM 6" OR PIPE SLEEVE DIAMETER APART (WHICHEVER IS GREATER.)

TYPICAL SLAB PENETRATION WITH SLEEVE DIAMETER LESS THAN 6"

46 TYPICAL PIPE SLEEVE IN CONCRETE SLAB

SCALE: N.T.S.

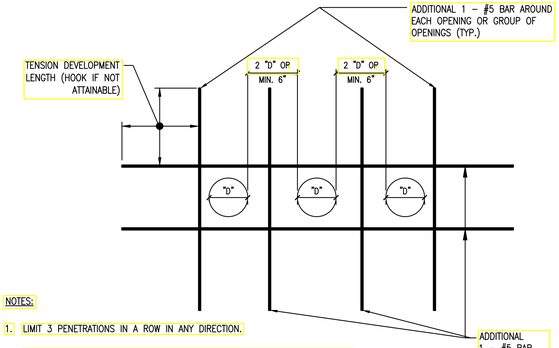


NOTE:
SPACE ADJACENT PIPE SLEEVES AS FOLLOWS:

PIPE DIAMETER (OUTSIDE DIA.)	CLEAR DISTANCE BETWEEN EDGES OF PIPE OPENINGS
DIA. ≤ 6"	CLEAR DIST. = PIPE DIA.
6" < DIA. ≤ 12"	CLEAR DIST. = 6"
12"<DIA. ≤ 24"	CLEAR DIST. = WALL THICKNESS

47 TYPICAL PIPE SLEEVE IN CONCRETE WALL

SCALE: N.T.S.



NOTES:

1. LIMIT 3 PENETRATIONS IN A ROW IN ANY DIRECTION.
2. COORDINATE WITH TYPICAL DETAIL FOR FORMED CONCRETE SLAB PIPE SLEEVE.
3. SHOULD PENETRATIONS BE CUT AFTER CONCRETE IS POURED, CONTRACTOR TO SUBMIT PLAN SHOWING ALL PROPOSED CORE DRILLING LOCATIONS TO E.O.R. FOR APPROVAL. CONTRACTOR TO USE NDE METHODS TO LOCATE REBAR PRIOR TO CUTTING SLAB.

48 TYPICAL SLAB PENETRATION WITH SLEEVE DIAMETER LESS THAN 6"

SCALE: N.T.S.

REVISIONS

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Estate Fortuna, Charlotte Amalie
St. Thomas, USVI 00801

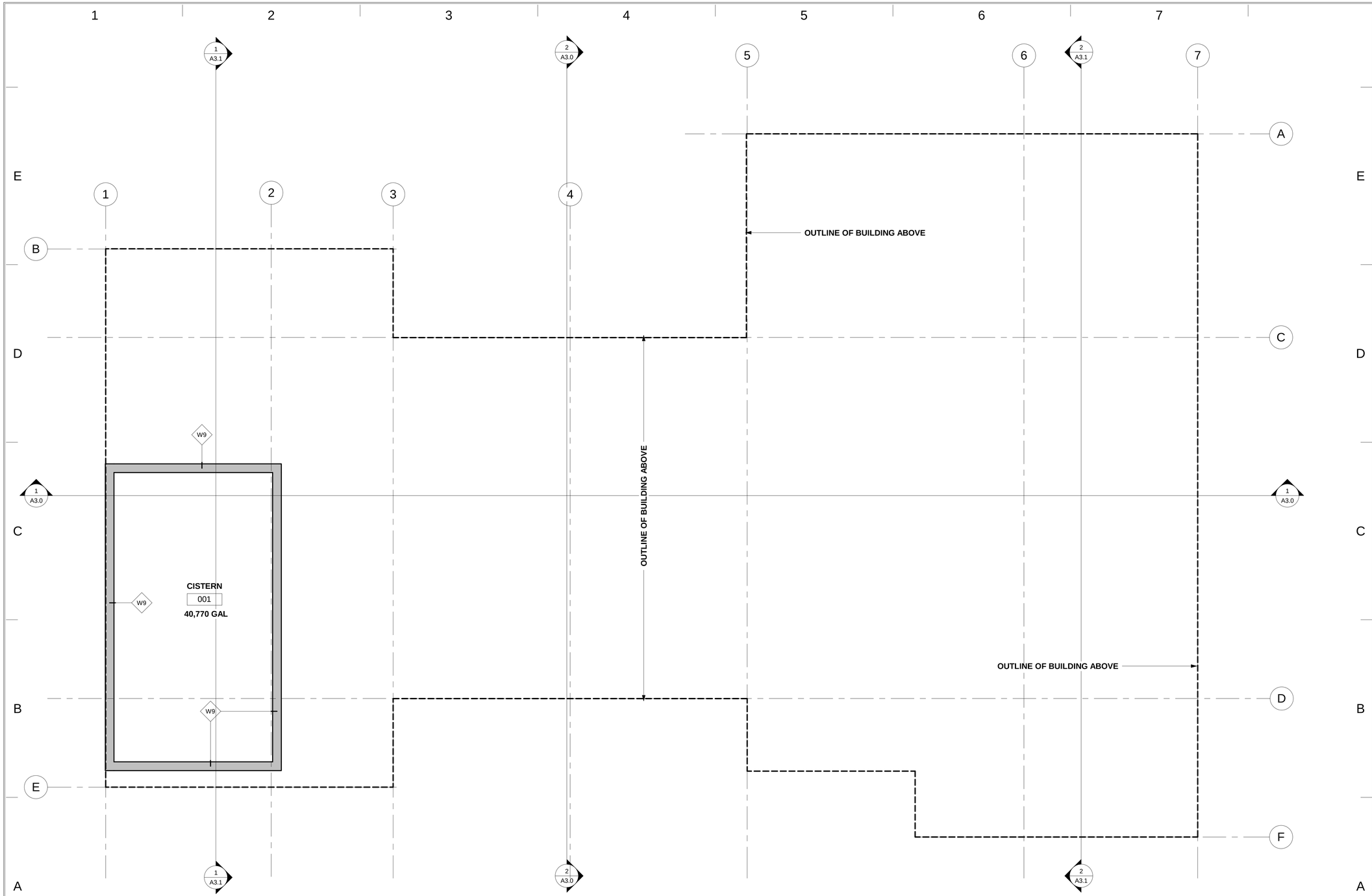
DATE: August, 2024
DRAWN BY: DC
CHECKED BY: DC
APPROVED BY: DC

PROJECT NO.:
CONTRACT NO.:

SHEET NO.: S018

STRUCTURAL DETAILS

PROFESSIONAL ENGINEER
DAMIAN CARTWRIGHT
28851-IB
REGISTERED



1 CISTERN LEVEL - IDENTIFICATION PLAN

3/16" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

Jaredian Design Group
Architects, Engineers and Construction Managers

5143 Palm Passage,
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US Virgin Islands 00802
Post Office Box 6218
St. Thomas, U.S. Virgin Islands 00804-6218
telephone: 340.777.1600
e-mail: jaredandesigngroup@gmail.com
website: www.jaredian.com

ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN
ISLANDS

DATE:	06.20.2024
DRAWN BY:	B.J.S.
CHECKED BY:	J.P.W.
APPROVED BY:	J.P.W.

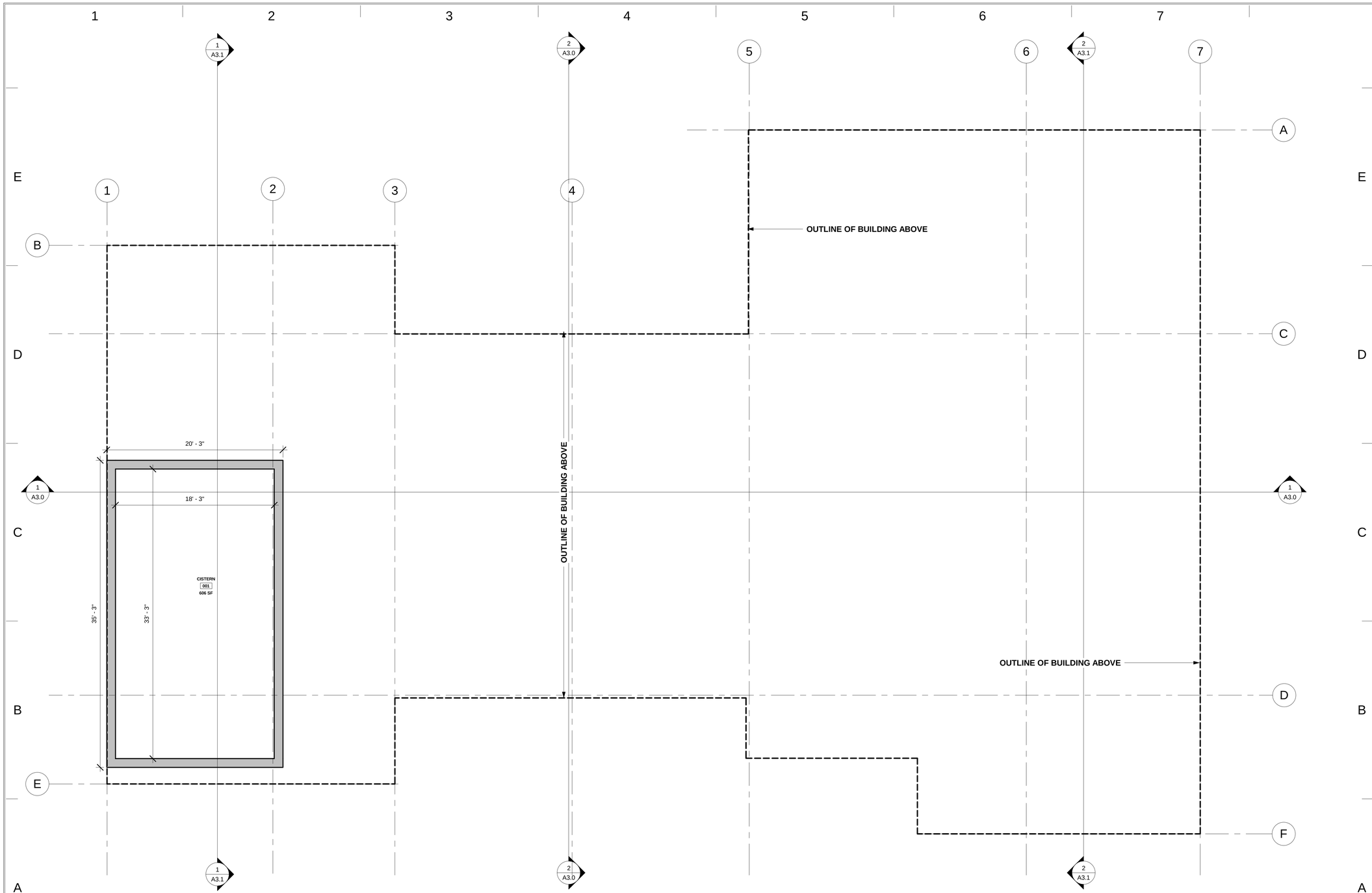
PROJECT NO.: 23-005.E

CONTRACT NO.: -

SHEET NO.: 0A1.0

CISTERN LEVEL - IDENTIFICATION PLAN

LICENSED ARCHITECT
U.S. VIRGIN ISLANDS



1 CISTERN LEVEL - DIMENSION PLAN

3/16" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.)
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WEST END
ST. THOMAS, U.S. VIRGIN
ISLANDS

DATE: 06.20.2024

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CHECKED BY: J.P.W.

APPROVED BY: J.P.W.

PROJECT NO.: 23-005.E

CONTRACT NO.: -

SHEET NO.: 0A1.1

CISTERN LEVEL -DIMENSION PLAN

REGISTERED ARCHITECT
U.S. VIRGIN ISLANDS

USABLE FLOOR AREAS (ICC)

THE PORTIONS OF THE FLOOR AREA WITHIN THE STORM SHELTER ENVELOPE NOT INCLUDING ***OCCUPANT SUPPORT AREAS***, USED TO DETERMINE THE DESIGN ***OCCUPANT CAPACITY*** OF THE STORM SHELTER. (B2-8)

ROOM	USABLE FLOOR AREA
SAFE ROOM/ MULTIPURPOSE ROOM	301 SF

SAFE ROOM ENVELOPE AREA: 2044 SF

GENERATOR 180" L x 44" W x 125" H 200kW/ 250 kVA

EYEWASH STATION

EXPANSION JOINT

CONCRETE COLUMN TYP.

1 MAIN LEVEL - IDENTIFICATION PLAN
3/16" = 1'-0"

REVISIONS		
NO.	DATE	REMARKS
1	7/2/25	SAFE ROOM NOTE ADDED
2	7/2/25	SAFE ROOM DOOR RELOCATION
3	7/2/25	EXPANSION JOINT RELOCATION

CONSULTANTS

JDG Jaredian Design Group
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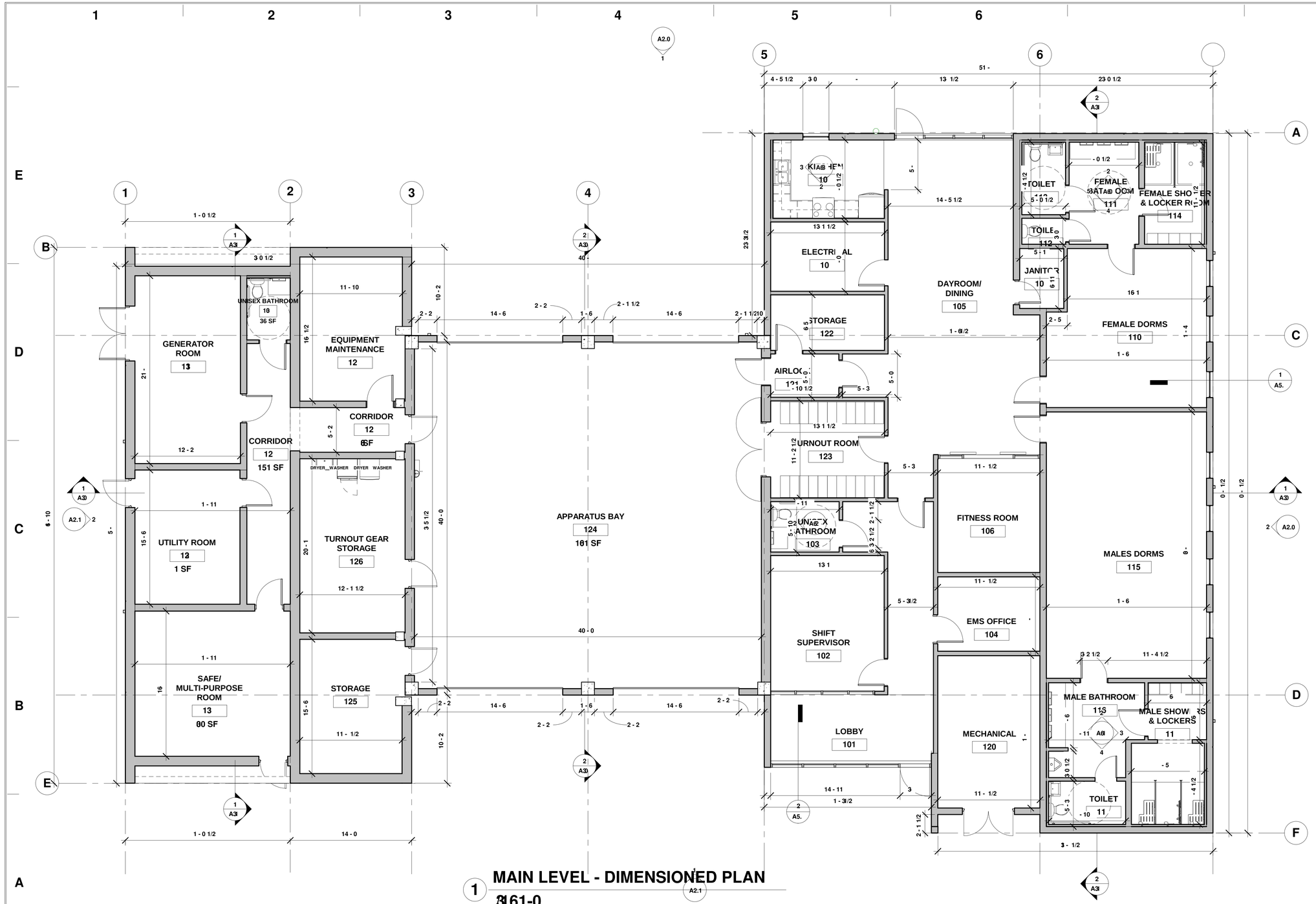
ESTATE FORTUNA (TANGO CO.) FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE:	06.20.2024
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APPROVED BY:	J.P.W.
PROJECT NO.:	23-005.E
CONTRACT NO.:	-
SHEET NO.:	1A1.0

FIRST LEVEL IDENTIFICATION PLAN

LICENSED ARCHITECT J.P.W. U.S. VIRGIN ISLANDS



1 MAIN LEVEL - DIMENSIONED PLAN

3/16" = 1'-0"

REVISIONS		
NO.	DATE	REMARKS

CONSULTANTS

5143P P
S F - S B24-25 S.T
US V I 0002
P O B 81
S.T U.S.V I 0004-81
: 80..160
- : . .
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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

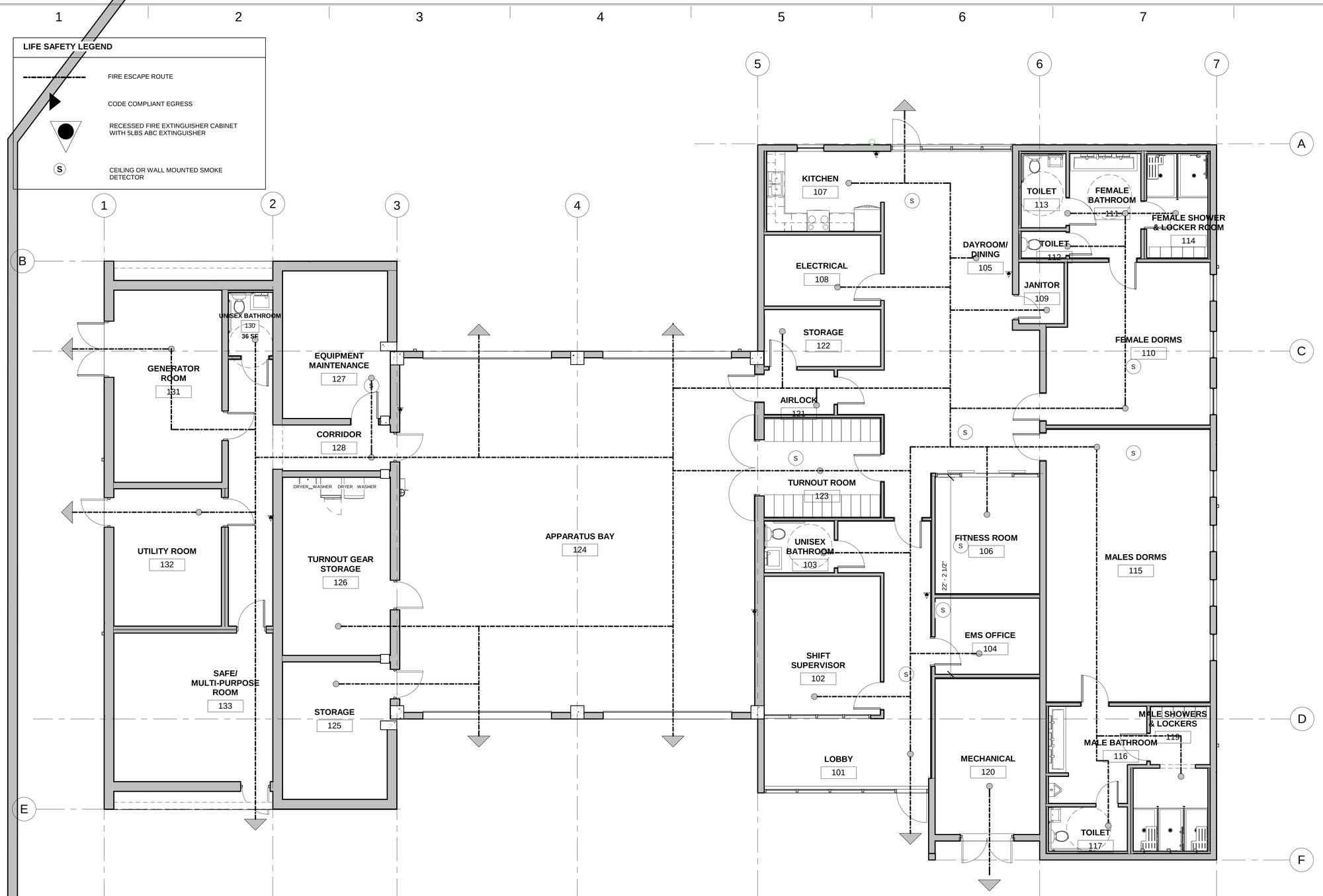
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WEST END
ST. THOMAS U.S. VIRGIN ISLANDS

DATE:	0820.2024
DRAWN BY:	B.J.S.
CHECKED BY:	J.P.W.
APPROVED BY:	J.P.W.
PROJECT NO.:	2005.E
CONTRACT NO.:	-
SHEET NO.:	1A1.1

FIRST LEVEL DIMENSION PLAN

LIFE SAFETY LEGEND

- FIRE ESCAPE ROUTE
- CODE COMPLIANT EGRESS
- RECESSED FIRE EXTINGUISHER CABINET WITH 5LBS ABC EXTINGUISHER
- (S) CEILING OR WALL MOUNTED SMOKE DETECTOR



1 MAIN LEVEL - LIFE SAFETY PLAN
3/16" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

JDG Jaredian Design Group
Architects, Engineers and Construction Managers

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ST. THOMAS, U.S. VIRGIN ISLANDS

DATE:	06.20.2024
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APPROVED BY:	J.P.W.

PROJECT NO.: 23-005.E

CONTRACT NO.: -

SHEET NO.: 1A1.2

FIRST LEVEL LIFE SAFETY PLAN

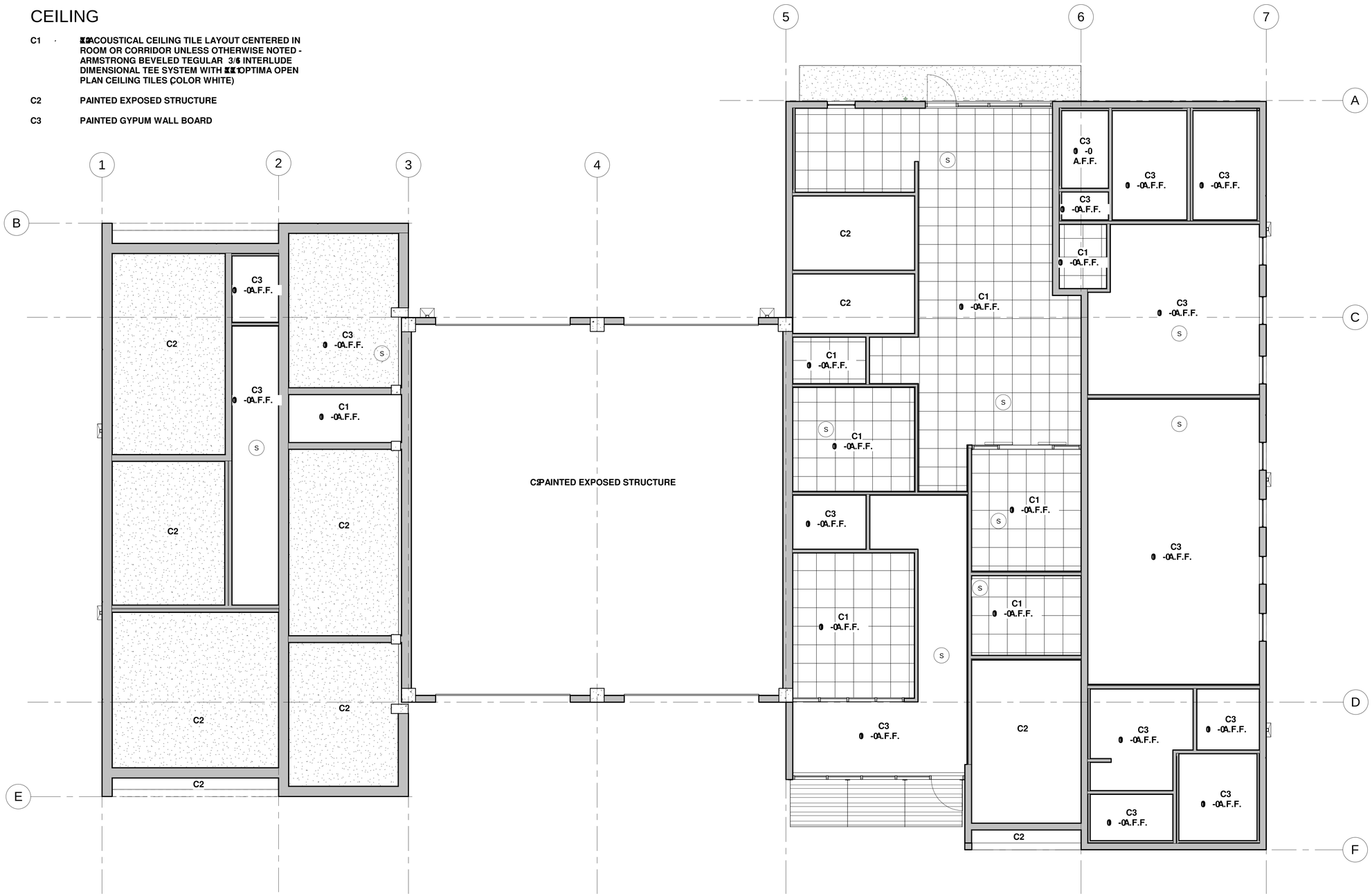


CEILING

C1 · **ACOUSTICAL CEILING TILE LAYOUT CENTERED IN ROOM OR CORRIDOR UNLESS OTHERWISE NOTED - ARMSTRONG BEVELED TEGULAR 3/6 INTERLUDE DIMENSIONAL TEE SYSTEM WITH OPTIMA OPEN PLAN CEILING TILES (COLOR WHITE)**

C2 **PAINTED EXPOSED STRUCTURE**

C3 **PAINTED GYPUM WALL BOARD**



1 REFLECTED CEILING PLAN

3/16" = 1'-0"

REVISIONS		
NO.	DATE	REMARKS

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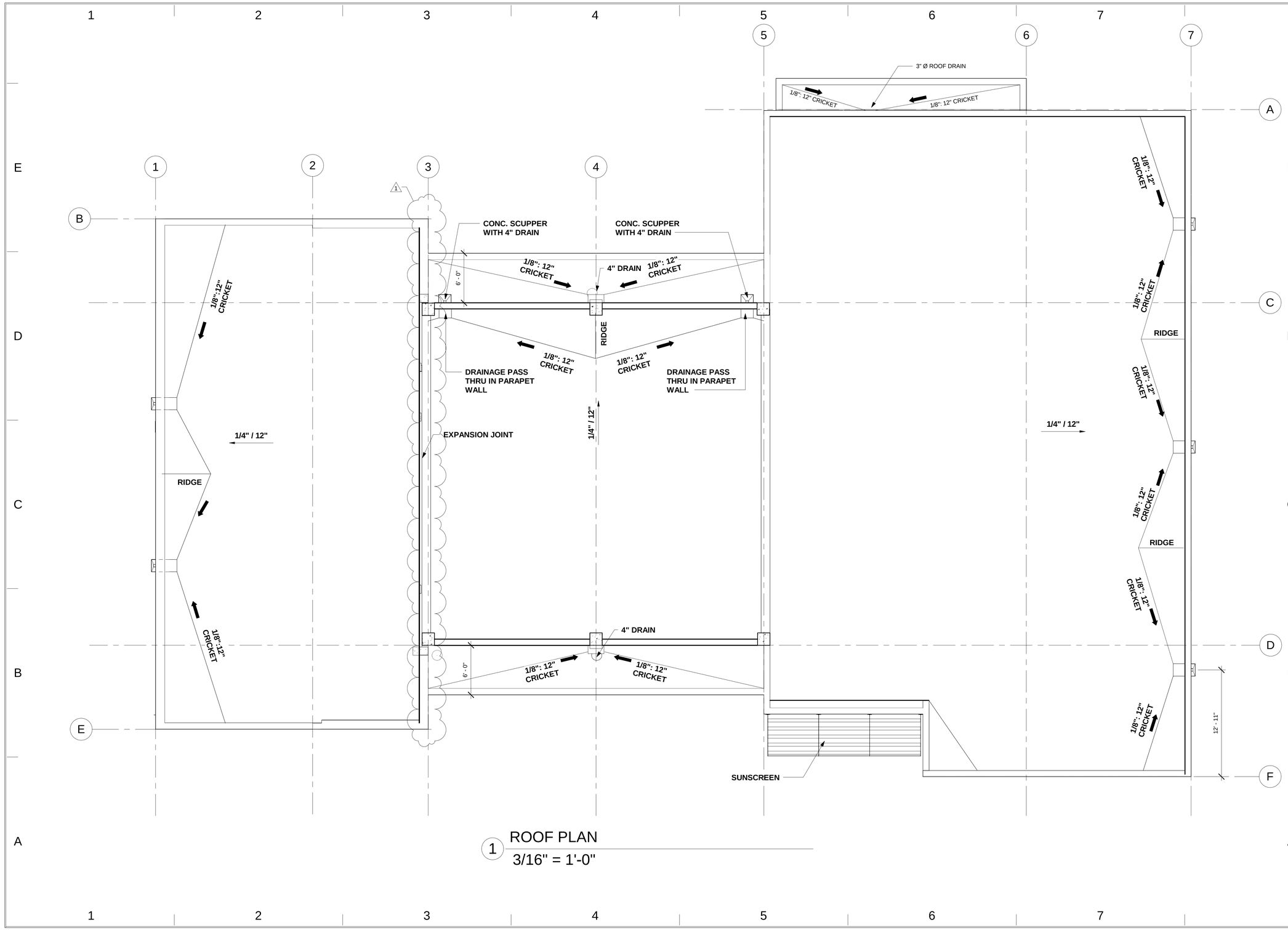
ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE:	06.20.2024
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PROJECT NO.:	23-005.E
CONTRACT NO.:	-
SHEET NO.:	1A1.3

FIRST LEVEL REFLECTED CEILING PLAN

LICENSED ARCHITECT U.S. VIRGIN ISLANDS



1 ROOF PLAN
3/16" = 1'-0"

REVISIONS		
NO.	DATE	REMARKS
1	7/2/25	SCHEDULE REVISION

CONSULTANTS

Jaredian Design Group
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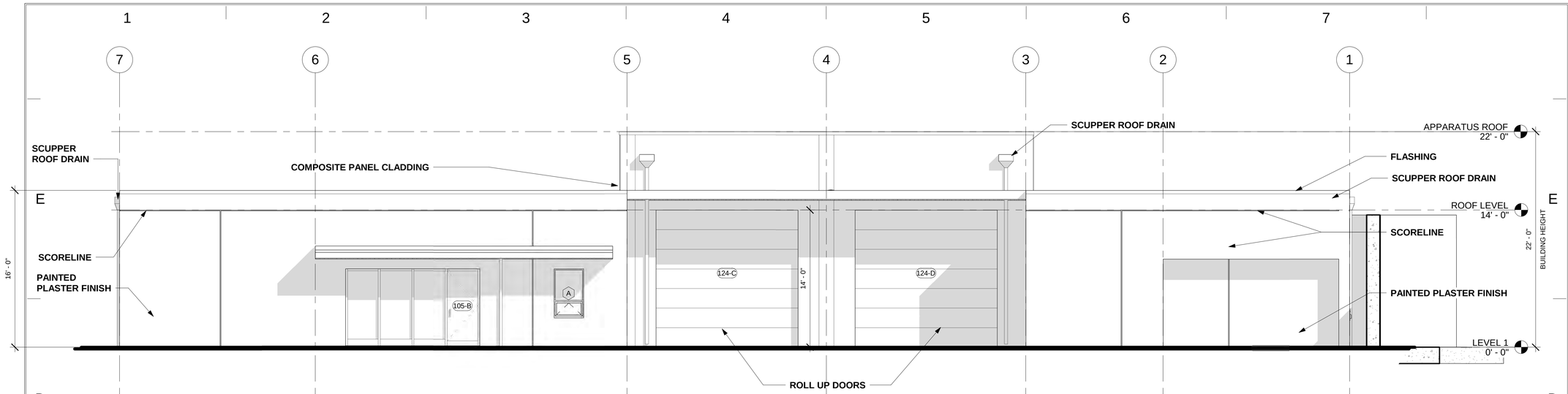
ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE:	06.20.2024
DRAWN BY:	B.J.S.
CHECKED BY:	J.P.W.
APPROVED BY:	J.P.W.
PROJECT NO.:	23-005.E
CONTRACT NO.:	-
SHEET NO.:	1A1.4

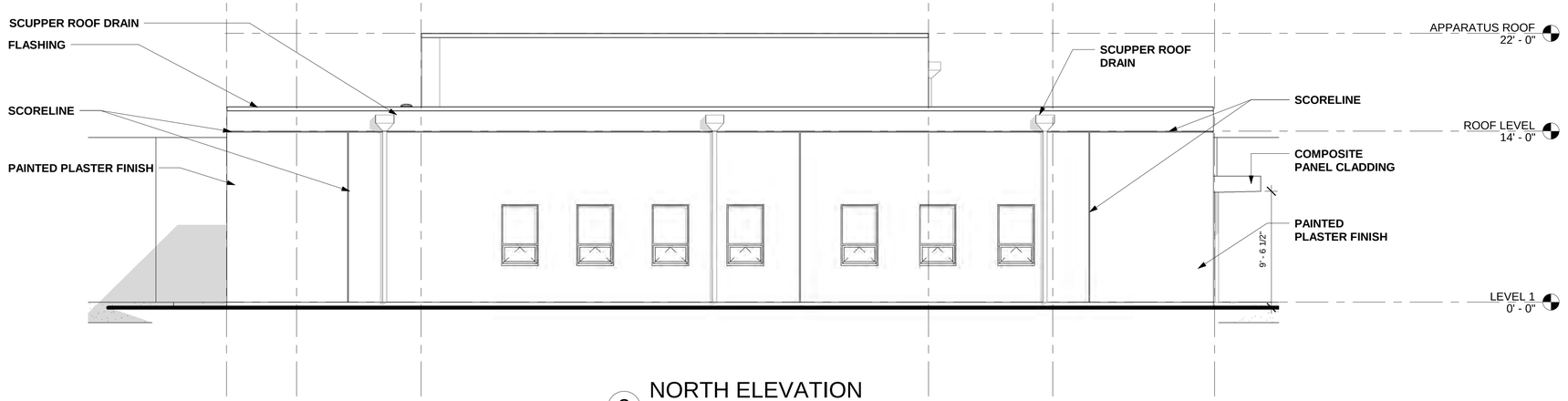
ROOF PLAN

REGISTERED ARCHITECT
U.S. VIRGIN ISLANDS



1 WEST ELEVATION

3/16" = 1'-0"



2 NORTH ELEVATION

3/16" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

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WEST END
ST. THOMAS, U.S. VIRGIN
ISLANDS

DATE:	06.20.2024
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APPROVED BY:	J.P.W.

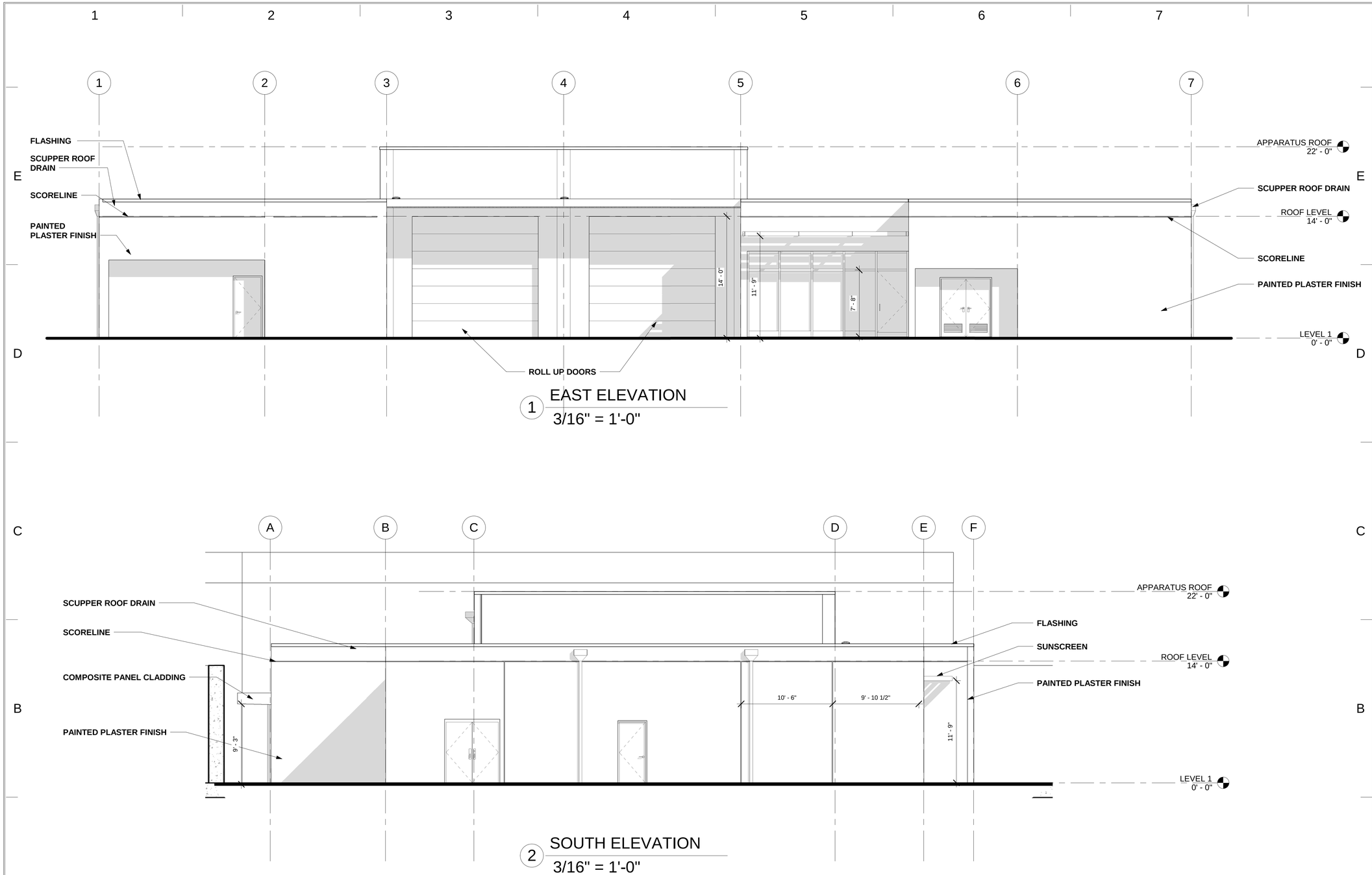
PROJECT NO.: 23-005.E

CONTRACT NO.: -

SHEET NO.: A2.0

ELEVATIONS

REGISTERED ARCHITECT
U.S. VIRGIN ISLANDS



1 EAST ELEVATION
3/16" = 1'-0"

2 SOUTH ELEVATION
3/16" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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Architects, Engineers and Construction Managers

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
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ISLANDS

DATE:	06.20.2024
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APPROVED BY:	J.P.W.

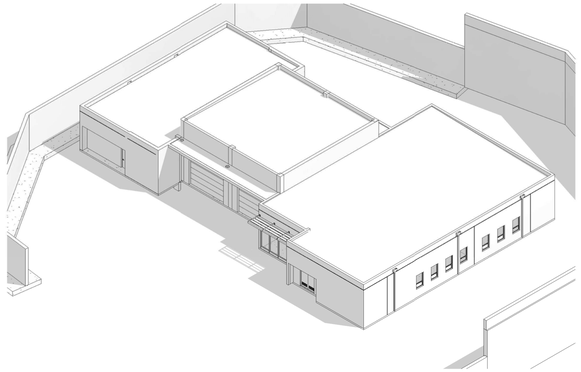
PROJECT NO.: 23-005.E

CONTRACT NO.: -

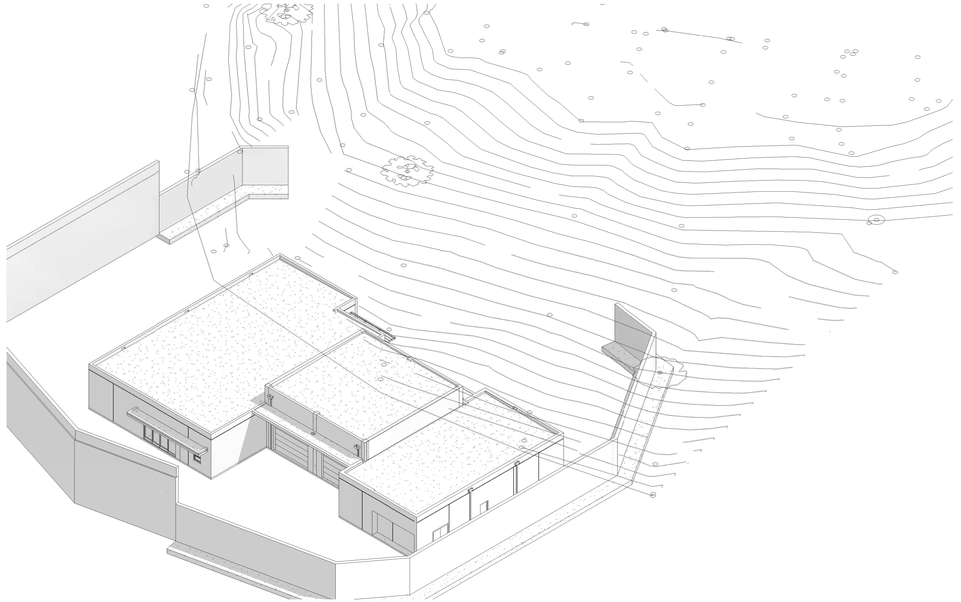
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ELEVATIONS

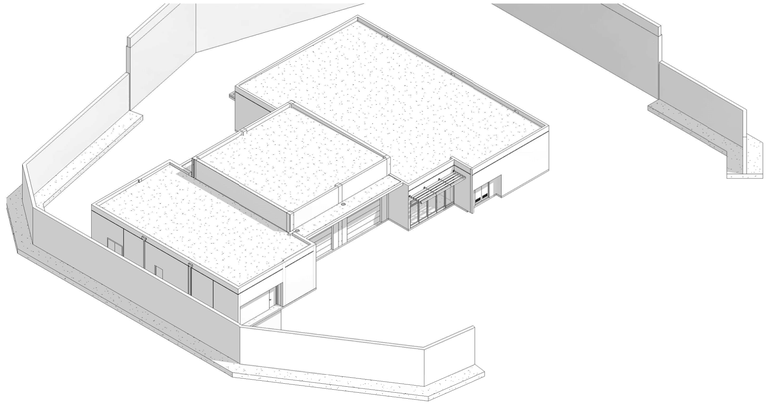
REGISTERED ARCHITECT
U.S. VIRGIN ISLANDS



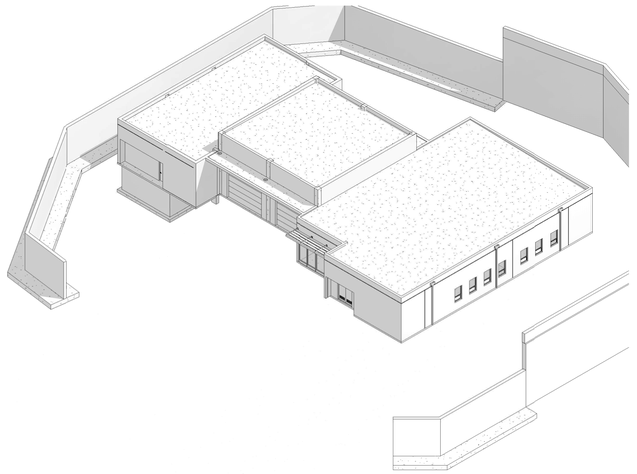
1 BUILDING AXON-1



2 BUILDING AXON-2



3 BUILDING AXON-3



4 BUILDING AXON-4

REVISIONS		
NO.	DATE	REMARKS

CONSULTANTS

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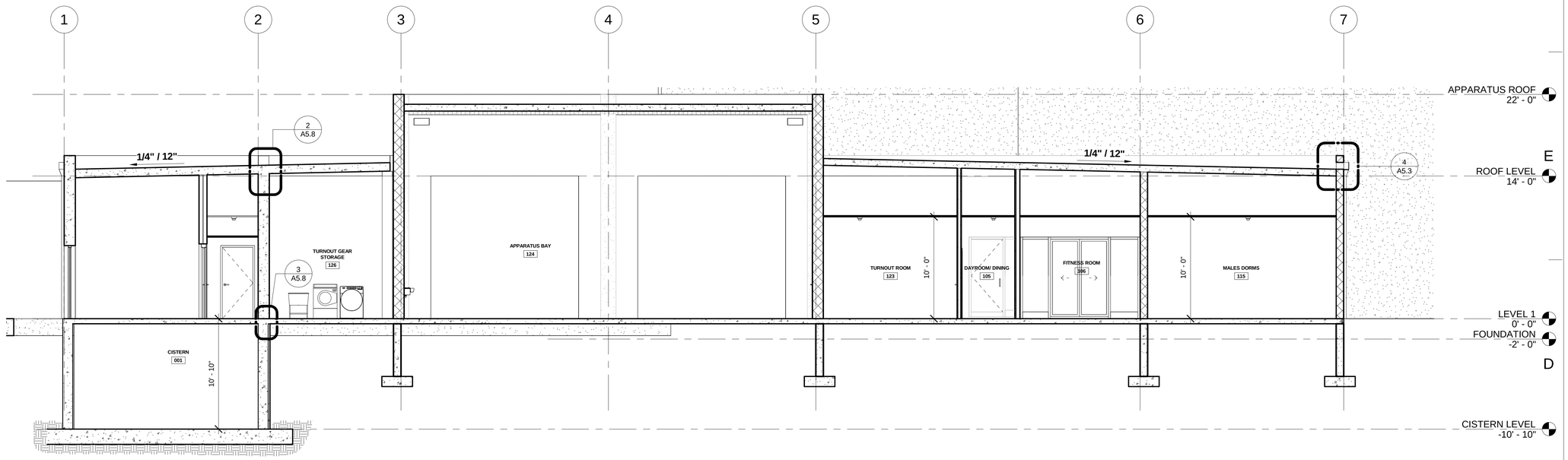
ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE:	06.20.2024
DRAWN BY:	B.J.S.
CHECKED BY:	J.P.W.
APPROVED BY:	J.P.W.
PROJECT NO.:	23-005.E
CONTRACT NO.:	-
SHEET NO.:	A2.2

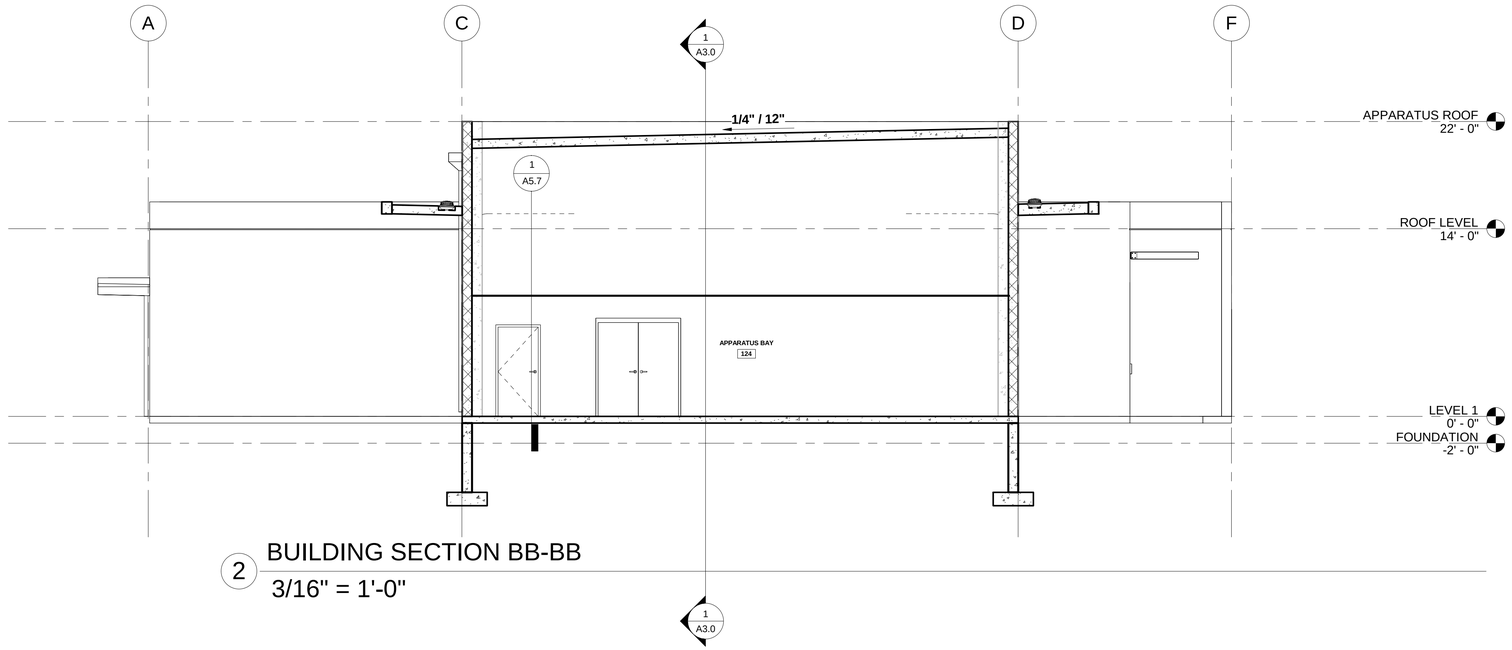
AXONS

REGISTERED ARCHITECT
U.S. VIRGIN ISLANDS



1 BUILDING SECTION AA-AA

3/16" = 1'-0"



2 BUILDING SECTION BB-BB

3/16" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

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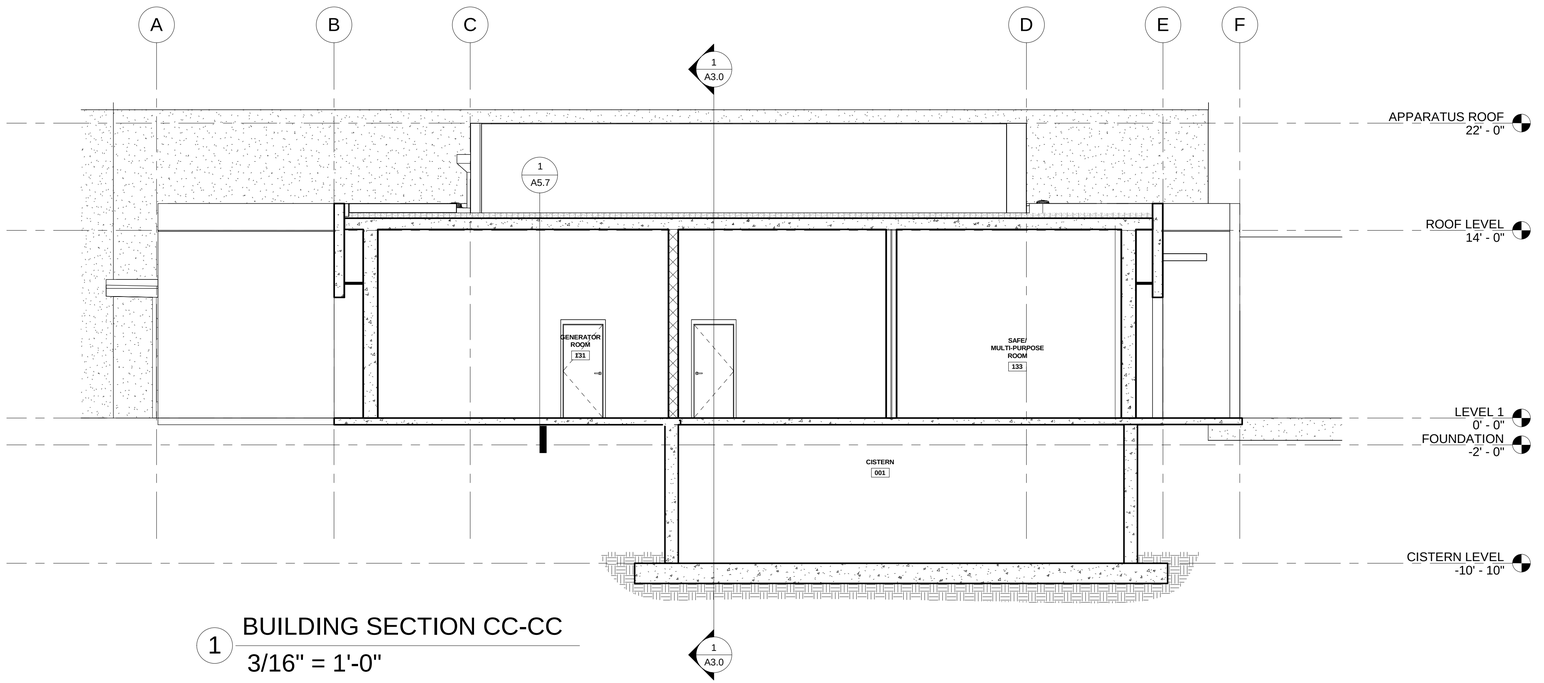
ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

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CONTRACT NO.:	-
SHEET NO.:	A3.0

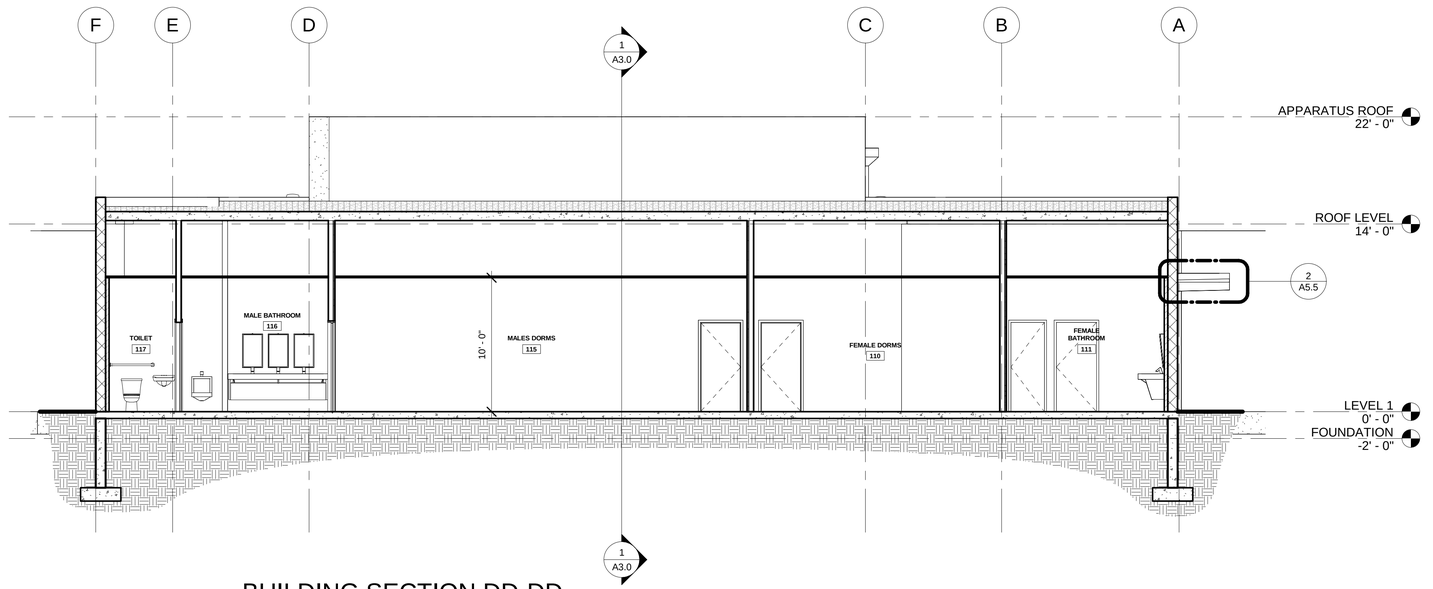
BUILDING SECTIONS

REGISTERED ARCHITECT
U.S. VIRGIN ISLANDS



1 BUILDING SECTION CC-CC

3/16" = 1'-0"



2 BUILDING SECTION DD-DD

3/16" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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SHEET NO.:	A3.1

BUILDING SECTIONS

LICENSED ARCHITECT
U.S. VIRGIN ISLANDS

ROOM FINISH SCHEDULE

ROOM NO.	ROOM NAME	Area	FLOOR		BASE		WALL								CEILING				REMARKS
							NORTH		SOUTH		EAST		WEST						
			MATL	FIN	MATL	FIN	MATL	FIN	MATL	FIN	MATL	FIN	MATL	FIN	MATL	FIN	HEIGHT	MOLDING	
001	CISTERN	606 SF																	
101	LOBBY	143 SF	CONC.	F1	B1			P1		P1		P1		P1		C1			
102	SHIFT SUPERVISOR	207 SF	CONC.	F1	B1			P1		P1		P1		P1		C1			
103	UNISEX BATHROOM	46 SF	CONC.	F1				P1		P1		P1		P1		C3			
104	EMS OFFICE	101 SF	CONC.	F1				P1		P1		P1		P1		C1			
105	DAYROOM/ DINING	629 SF	CONC.	F1	B1			P1		P1		P1		P1		C1			
106	FITNESS ROOM	154 SF	CONC.	F1				P1		P1		P1		P1		C1			
107	KITCHEN	116 SF	CONC.	F1	B1			P1		P1		P1		P1		C3			
108	ELECTRICAL	105 SF	CONC.	F1				P1		P1		P1		P1		C2			
109	JANITOR	35 SF	CONC.	F2				P1		P1		P1		P1		C1			
110	FEMALE DORMS	321 SF	CONC.	F1	B1			P1		P1		P1		P1		C1			
111	FEMALE BATHROOM	95 SF	CONC.	F1				P1		P1		P1		P1		C3			
112	TOILET	15 SF	CONC.	F1				P1		P1		P1		P1		C3			
113	TOILET	42 SF	CONC.	F1				P1		P1		P1		P1		C3			
114	FEMALE SHOWER & LOCKER ROOM	81 SF	CONC.	F1				P1		P1		P1		P1		C3			
115	MALES DORMS	568 SF	CONC.	F1	B1			P1		P1		P1		P1		C1			
116	MALE BATHROOM	113 SF	CONC.	F1				P1		P1		P1		P1		C3			
117	TOILET	44 SF	CONC.	F1				P1		P1		P1		P1		C3			
119	MALE SHOWERS & LOCKERS	125 SF	CONC.	F1				P1		P1		P1		P1		C3			
120	MECHANICAL	207 SF	CONC.	F1				P1		P1		P1		P1		C2			
121	AIRLOCK	39 SF	CONC.	F1				P1		P1		P1		P1		C1			
122	STORAGE	84 SF	CONC.	F1				P1		P1		P1		P1		C1			
123	TURNOUT ROOM	147 SF	CONC.	F1	B1			P1		P1		P1		P1		C1			
124	APPARATUS BAY	1601 SF	CONC.	F2			CMU	P2	CMU	P2	CMU	P2	CMU	P2		C2			
125	STORAGE	184 SF	CONC.	F2				P2		P2		P2		P2		C2			
126	TURNOUT GEAR STORAGE	244 SF	CONC.	F1	B1			P1		P1		P1		P1		C1			
127	EQUIPMENT MAINTENANCE	198 SF	CONC.	F1				P2		P2		P2		P2		C2			
128	CORRIDOR	63 SF	CONC.	F1	B1			P1		P1		P1		P1		C1			
129	CORRIDOR	151 SF																	
130	UNISEX BATHROOM	36 SF	CONC.	F1				P1		P1		P1		P1		C3			
131	GENERATOR ROOM	264 SF	CONC.					P1		P1		P1		P1		C1			
132	UTILITY ROOM	188 SF																	
133	SAFE/ MULTI-PURPOSE ROOM	300 SF	CONC.	F1	B1			P1		P1		P1		P1		C3			
Grand total: 33		7253 SF																	

DOOR SCHEDULE

DOOR MARK	ASSEMBLY DESCRIPTION	TYPE	WIDTH	HEIGHT	THICKNESS	MATERIAL	COMMENTS
101	STOREFRONT DOOR	01	3' - 4 3/4"	7' - 0 3/4"		ALUMN.	IMPACT RESISTANT ASSEMBLY WITH THRESHOLD
102	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
103	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
104	SINGLE FLUSH W/ VISION LITE	03	3' - 0"	7' - 0"	0' - 1 3/4"	S.C. WOOD	
105-A	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
105-B	STOREFRONT DOOR	01	3' - 1 1/4"	7' - 1 1/2"		ALUMN.	IMPACT RESISTANT ASSEMBLY WITH THRESHOLD
106	STOREFRONT DOUBLE SLIDING	04	5' - 8 1/4"	7' - 7"	0' - 3"	ALUMN.	
108	SINGLE FLUSH W/ LOUVER	05	3' - 0"	6' - 8"	0' - 2"	S.C. WOOD	
109	SINGLE FLUSH	06	2' - 6"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
110	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
111	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
112	SINGLE FLUSH	06	2' - 6"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
113	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
114	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
115	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
116	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
117	SINGLE FLUSH	06	2' - 6"	6' - 8"	0' - 1 3/8"	S.C. WOOD	
119	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
120	DOUBLE FLUSH W/ LOUVER	07	6' - 0"	7' - 0"	0' - 1 3/4"	H.M.	207 MPH WIND DESIGN - IMPACT PROTECTIVE ASSEMBLY AND HARDWARE
121-A	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
121-B	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
122	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
123-A	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
123-B	DOUBLE FLUSH	08	6' - 0"	7' - 0"	0' - 1 3/4"	S.C. WOOD	
124-A	ROLL UP GARAGE DOOR	09	14' - 6"	14' - 0"	0' - 1 1/2"	H.M.	IMPACT RESISTANT ASSEMBLY
124-B	ROLL UP GARAGE DOOR	09	14' - 6"	14' - 0"	0' - 1 1/2"	H.M.	IMPACT RESISTANT ASSEMBLY
124-C	ROLL UP GARAGE DOOR	09	14' - 6"	14' - 0"	0' - 1 1/2"	H.M.	IMPACT RESISTANT ASSEMBLY
124-D	ROLL UP GARAGE DOOR	09	14' - 6"	14' - 0"	0' - 1 1/2"	H.M.	IMPACT RESISTANT ASSEMBLY
125	SINGLE FLUSH	11	3' - 0"	7' - 0"	0' - 1 3/4"	H.M.	207 MPH WIND DESIGN - IMPACT PROTECTIVE ASSEMBLY AND HARDWARE
126	SINGLE FLUSH	11	3' - 0"	7' - 0"	0' - 1 3/4"	H.M.	207 MPH WIND DESIGN - IMPACT PROTECTIVE ASSEMBLY AND HARDWARE
127	SINGLE FLUSH	02	3' - 0"	6' - 8"	0' - 1 3/4"	S.C. WOOD	
128	SINGLE FLUSH	11	3' - 0"	7' - 0"	0' - 1 3/4"	H.M.	207 MPH WIND DESIGN - IMPACT PROTECTIVE ASSEMBLY AND HARDWARE
130	SINGLE FLUSH	10	3' - 0"	7' - 0"	0' - 1 3/4"	S.C. WOOD	
131-A	SINGLE FLUSH	10	3' - 0"	7' - 0"	0' - 1 3/4"	S.C. WOOD	
131-B	DOUBLE FLUSH	21	6' - 0"	7' - 0"	0' - 1 3/4"	H.M.	207 MPH WIND DESIGN - IMPACT PROTECTIVE ASSEMBLY AND HARDWARE
132-A	SINGLE FLUSH	10	3' - 0"	7' - 0"	0' - 1 3/4"	S.C. WOOD	
132-B	SINGLE FLUSH	11	3' - 0"	7' - 0"	0' - 1 3/4"	H.M.	207 MPH WIND DESIGN - IMPACT PROTECTIVE ASSEMBLY AND HARDWARE
133-A	SINGLE FLUSH	10	3' - 0"	7' - 0"	0' - 1 3/4"	S.C. WOOD	
133-B	SINGLE FLUSH	11	3' - 0"	7' - 0"	0' - 1 3/4"	H.M.	207 MPH WIND DESIGN - IMPACT PROTECTIVE ASSEMBLY AND HARDWARE
Grand total: 39							

1

WINDOW SCHEDULE

TYPE	DESCRIPTION	SIZE		GLAZING	MATERIAL	REMARKS
		WIDTH	HEIGHT			
A	3'-0"W x 5'-0"H	3' - 0"	5' - 0"	IMPACT RESISTANT GLASS	ALUMINUM	

INTERIOR FINISH SCHEDULE KEY

FLOOR

F1	IMPERVIOUS TILE FLOORING
F2	EPOXY RESIN SEAMLESS FIELD APPLIED FLOORING

WALL BASE

B1	VINYL COVE BASE

WALL FINISH

P1	PAINTED FINISH
P2	PLASTER FINISH

2

DOOR MATERIAL

S.C. WOOD	SOLID CORE WOOD
H.M.	HOLLOW METAL
ALUMN.	ALUMINUM

CEILING

C1	24X24 ACOUSTICAL CEILING TILE - ARMSTRONG BEVELED TEGULAR 3/16" INTERLUDE DIMENSIONAL TEE SYSTE, WITH 24"X24"X1" OPTIMA OPEN PLAN CEILING TILES (COLOR WHITE)
C2	PAINTED EXPOSED STRUCTURE
C3	PAINTED GYPUM WALL BOARD

WALL MATERIAL

T	TILE
CMU	CONCRETE MASONRY UNIT
CWB	CEMENT WALL BOARD
GWB	MOISTURE & MILDEW RESISTANT GYPSUM WALL BOARD
PNT	PAINTED FINISH
CONC.	CONCRETE

REVISIONS

NO.	DATE	REMARKS
1	7/2/25	SCHEDULE REVISION
2	7/2/25	DOOR ABBREVIATION

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

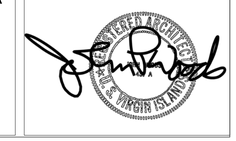
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WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

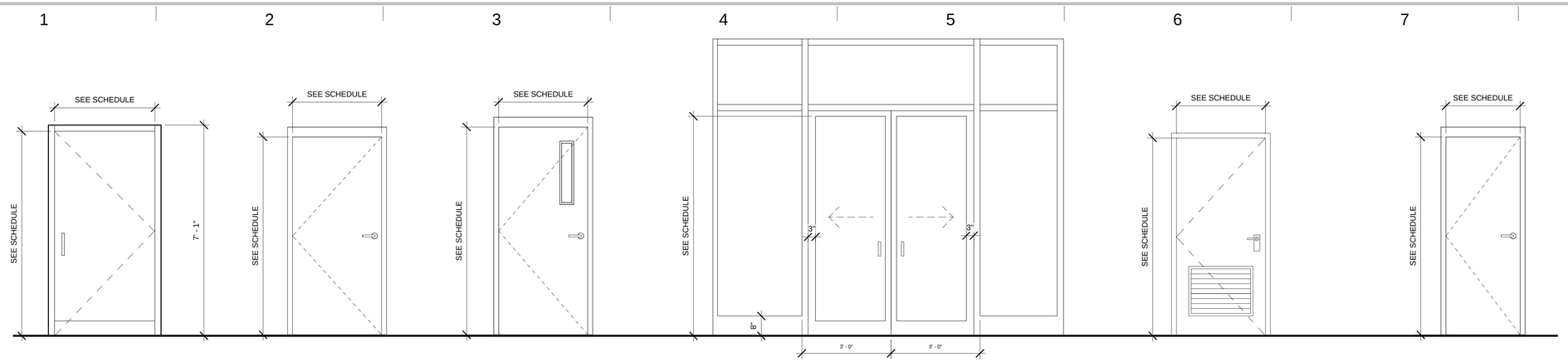
DATE: 06.20.2024
DRAWN BY: B.J.S.
CHECKED BY: J.P.W.
APPROVED BY: J.P.W.

PROJECT NO.: 23-005.E
CONTRACT NO.: -

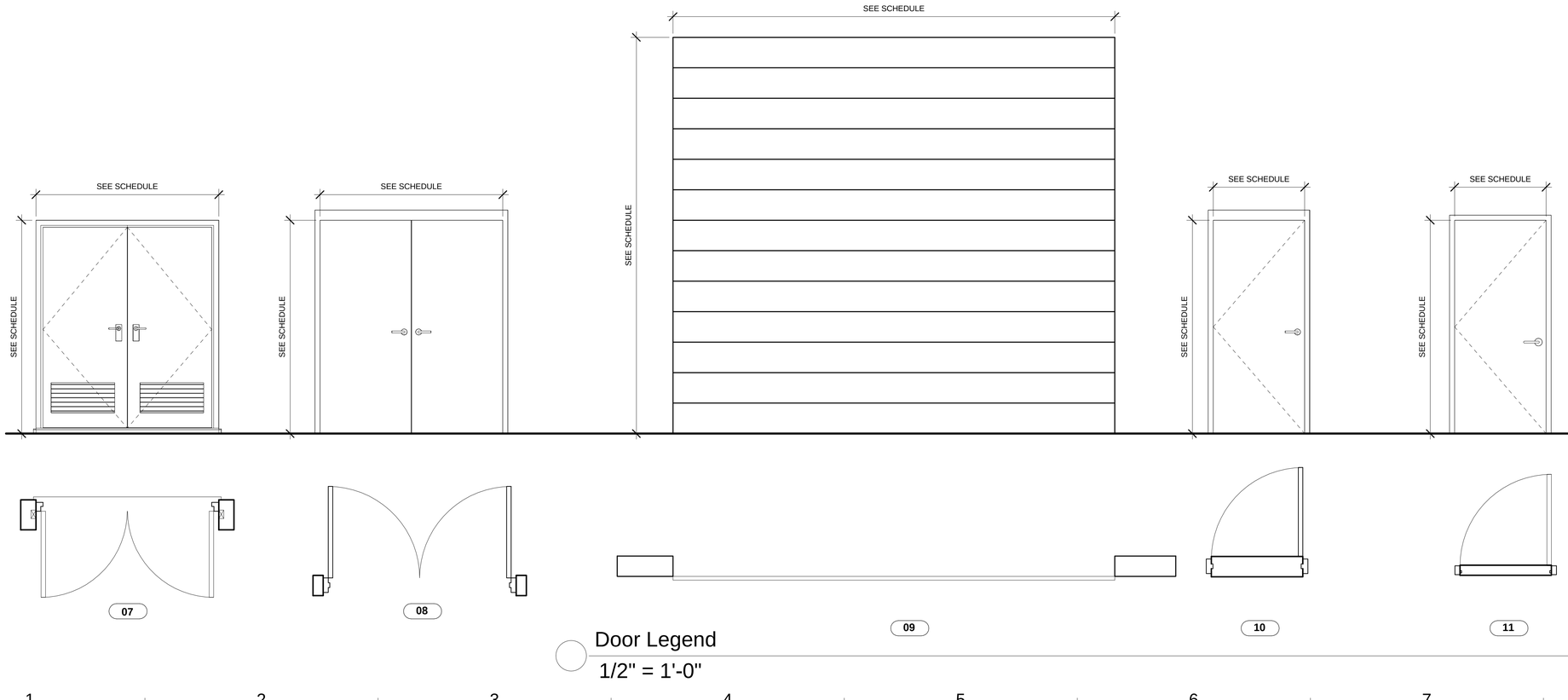
SHEET NO.: A4.0

SCHEDULES





PLAN VIEW (PARTIAL OPEN DOOR)



Door Legend

1/2" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN
ISLANDS

DATE:	06.20.2024
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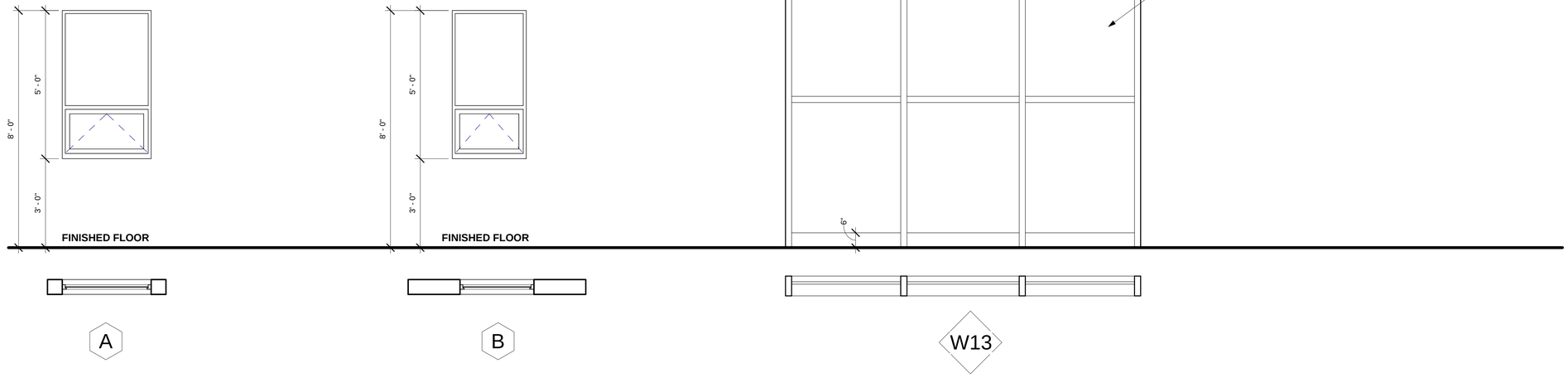
PROJECT NO.: 23-005.E

CONTRACT NO.: -

SHEET NO.: A4.1

DOOR ELEVATIONS





A

B

W13

REVISIONS		
NO.	DATE	REMARKS

CONSULTANTS

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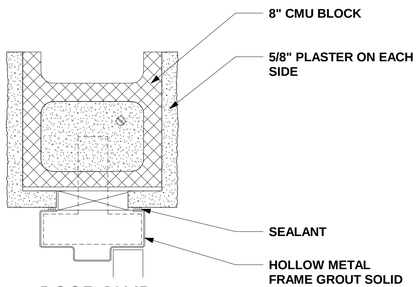
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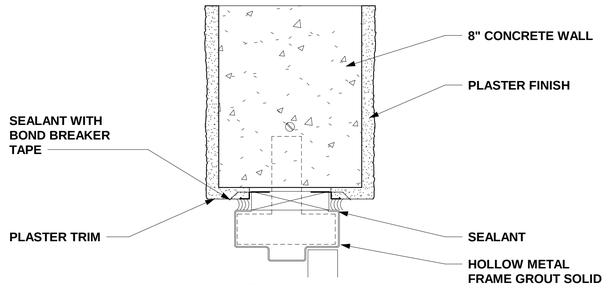
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A4.2

WINDOW ELEVATIONS

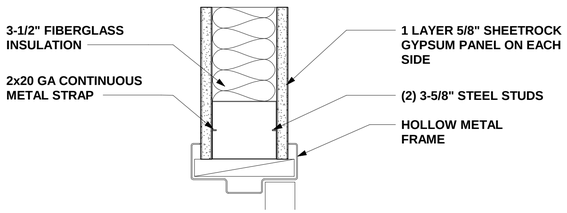
LICENSED ARCHITECT
U.S. VIRGIN ISLANDS
USA



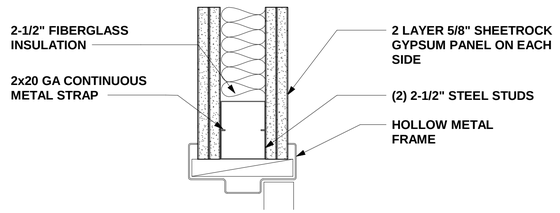
DOOR JAMB
8" CMU



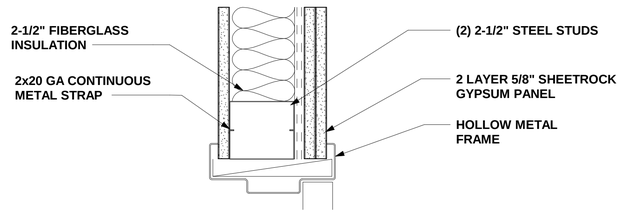
DOOR JAMB
8" CONCRETE



DOOR JAMB
5" STUD TYPE A



DOOR JAMB
5" STUD TYPE B



DOOR JAMB
6" STUD

1 JAMB DETAILS

3" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

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WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

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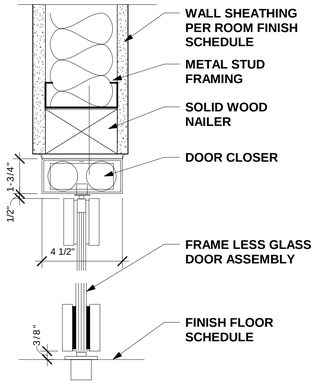
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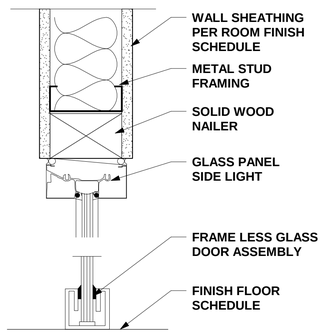
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JAMB DETAILS

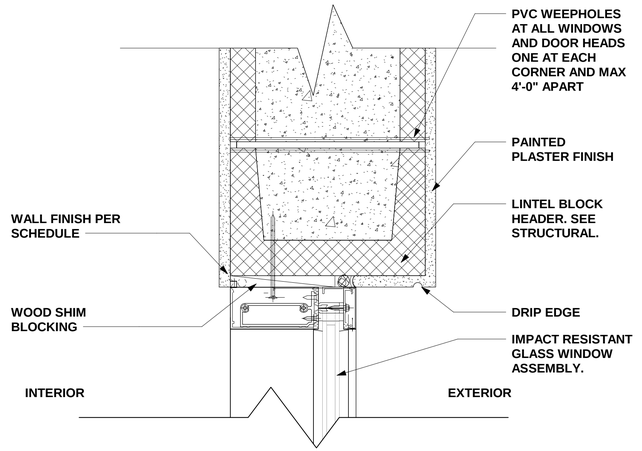
LICENSED ARCHITECT
ST. THOMAS, U.S. VIRGIN ISLANDS
USA



HEADER DETAIL AT DOOR



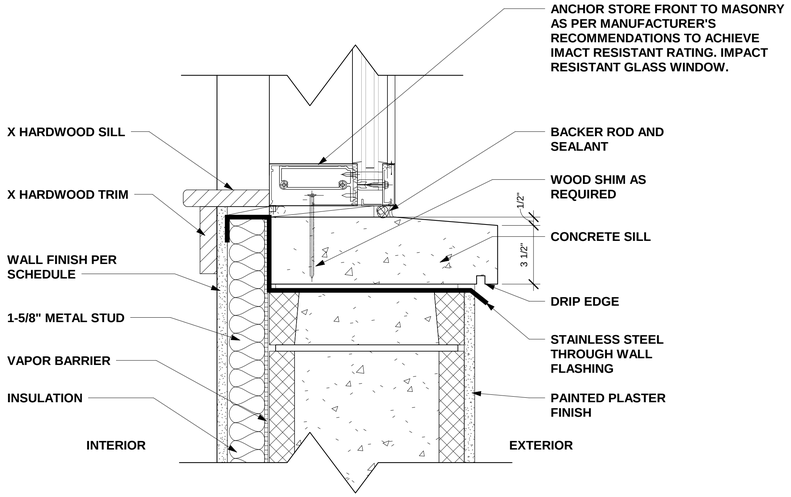
HEADER DETAIL AT GLASS



WINDOW HEADER DETAIL

1 HEADER AND JAMB DETAILS

3" = 1'-0"



WINDOW SILL DETAIL

2 WINDOW HEADER AND SILL DETAIL

3" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE:	06.20.2024
DRAWN BY:	B.J.S.
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APPROVED BY:	J.P.W.

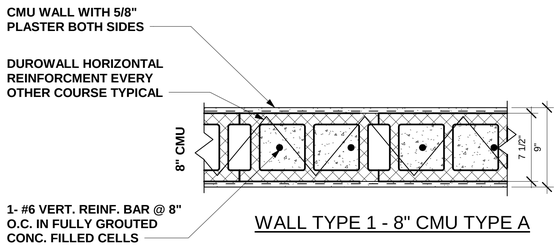
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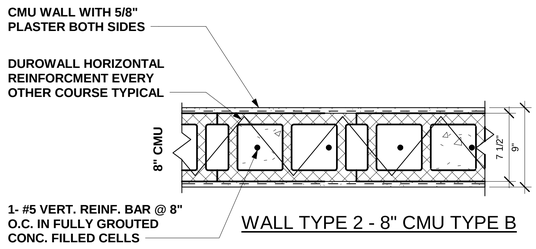
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JAMB DETAILS

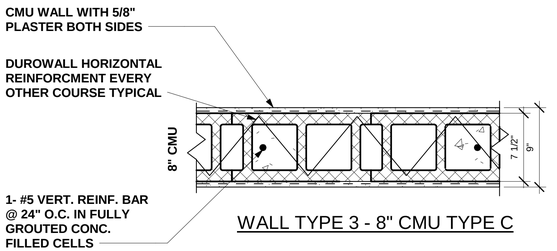




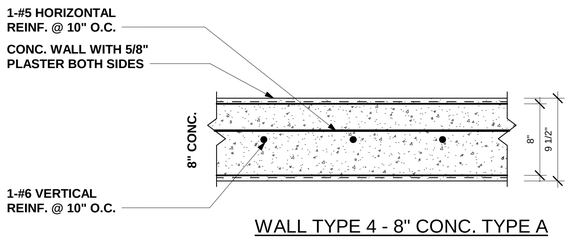
WALL TYPE 1 - 8" CMU TYPE A



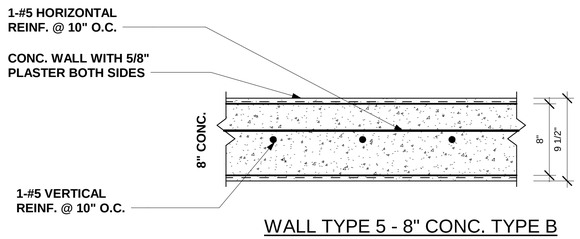
WALL TYPE 2 - 8" CMU TYPE B



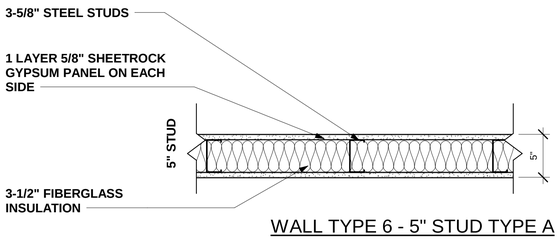
WALL TYPE 3 - 8" CMU TYPE C



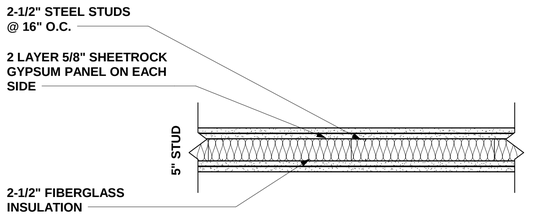
WALL TYPE 4 - 8" CONC. TYPE A



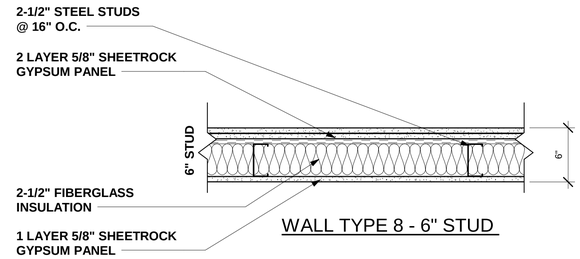
WALL TYPE 5 - 8" CONC. TYPE B



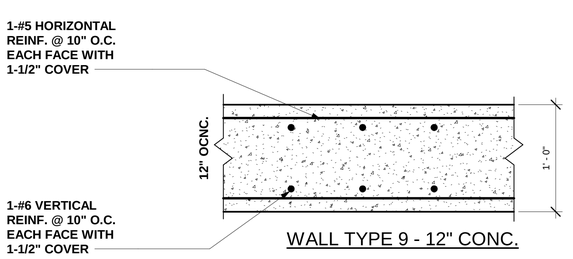
WALL TYPE 6 - 5" STUD TYPE A



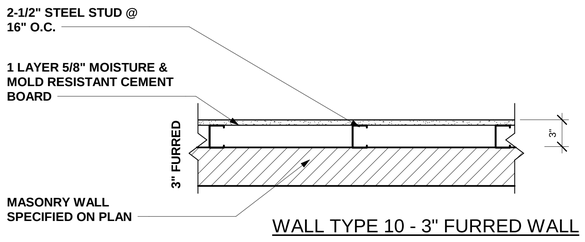
WALL TYPE 7 - 5" STUD TYPE B



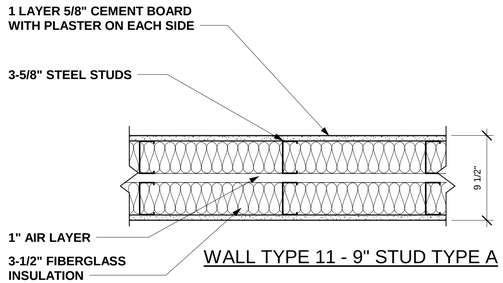
WALL TYPE 8 - 6" STUD



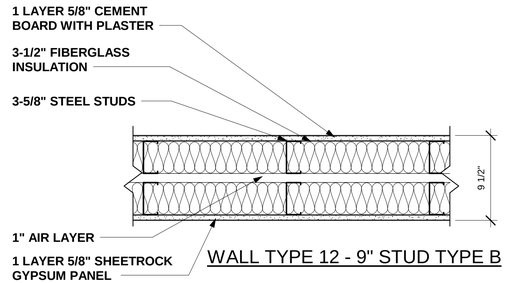
WALL TYPE 9 - 12" CONC.



WALL TYPE 10 - 3" FURRED WALL



WALL TYPE 11 - 9" STUD TYPE A



WALL TYPE 12 - 9" STUD TYPE B

1 WALL DETAILS

1 1/2" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.) FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

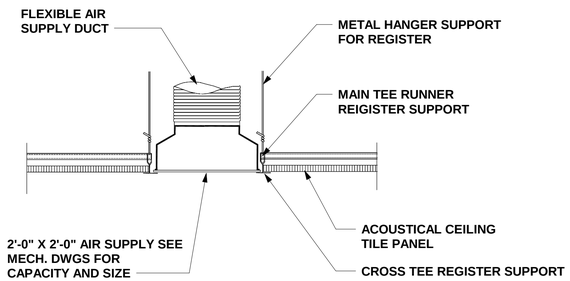
DATE: 06.20.2024
DRAWN BY: B.J.S.
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APPROVED BY: J.P.W.

PROJECT NO.: 23-005.E
CONTRACT NO.: -

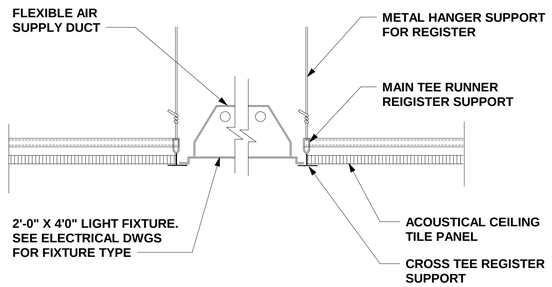
SHEET NO.: A5.0

WALL DETAILS

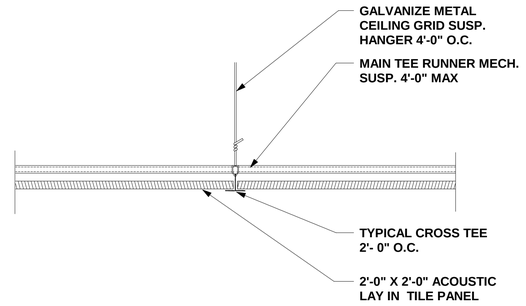
REGISTERED ARCHITECT U.S. VIRGIN ISLANDS



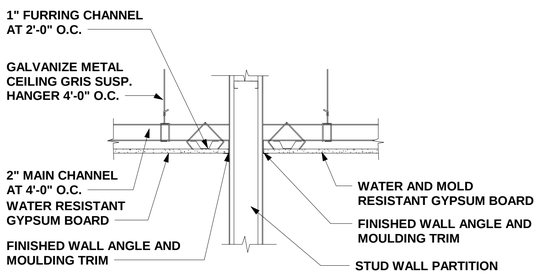
1 CEILING DETAIL AT REGISTER
3/4" = 1'-0"



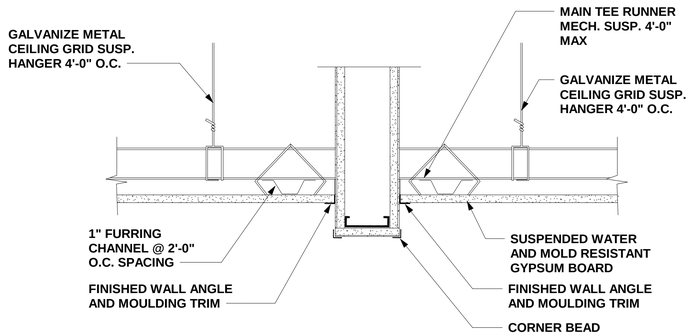
2 CEILING DETAIL AT LIGHT FIXTURE
3/4" = 1'-0"



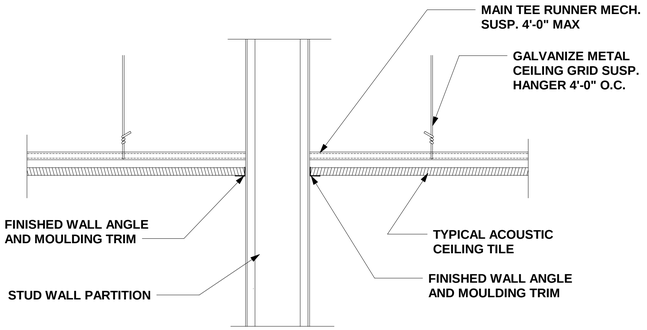
3 TYPICAL SUSPENDED CEILING DETAIL
3/4" = 1'-0"



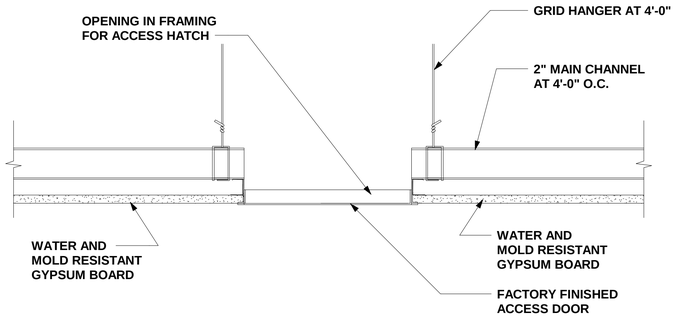
4 GYP. BOARD CEILING DETAIL
3/4" = 1'-0"



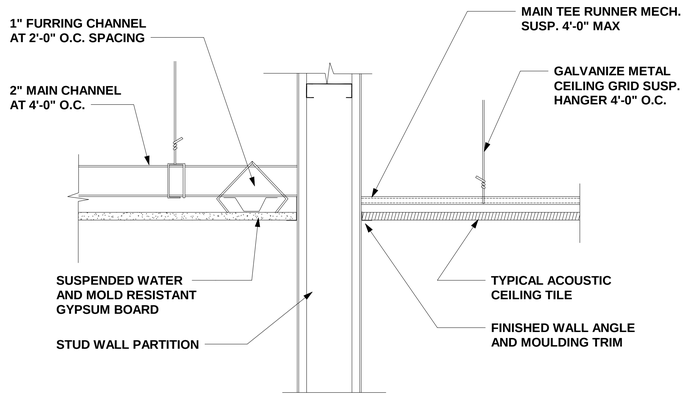
5 BULKHEAD DETAIL
3/4" = 1'-0"



6 ACT CEILING DETAIL
3/4" = 1'-0"



7 CEILING ACCESS HATCH DETAIL
3/4" = 1'-0"



8 CEILING DETAIL-GYP. BOARD & ACT CEILING
3/4" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

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website: www.jaredian.com

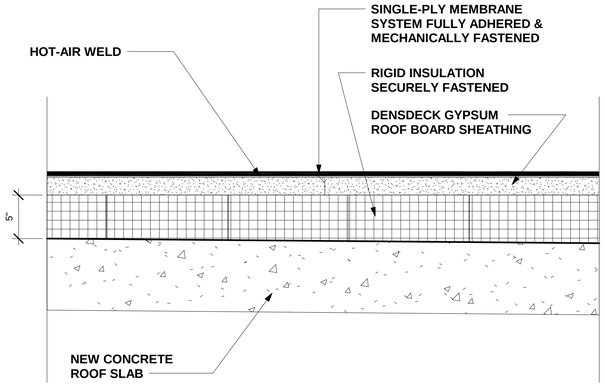
ESTATE FORTUNA (TANGO CO.) FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

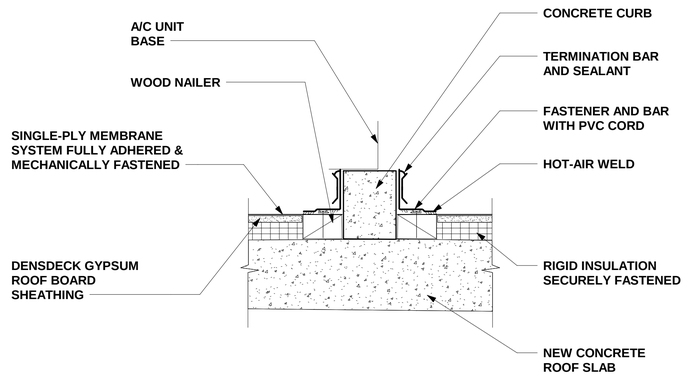
DATE:	06.20.2024
DRAWN BY:	B.J.S.
CHECKED BY:	J.P.W.
APPROVED BY:	J.P.W.
PROJECT NO.:	23-005.E
CONTRACT NO.:	-
SHEET NO.:	A5.1

CEILING DETAILS

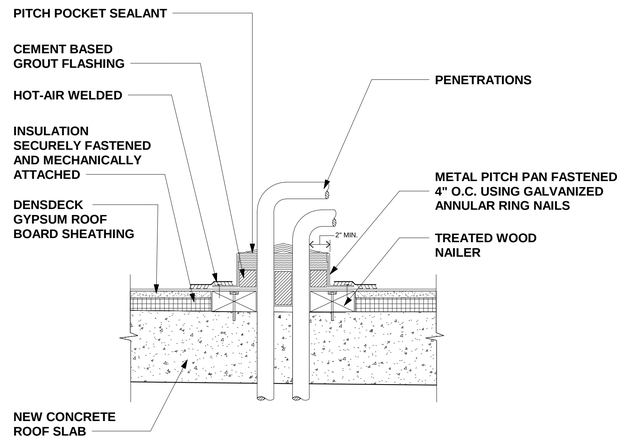
REGISTERED ARCHITECT U.S. VIRGIN ISLANDS



1 ROOF DRAIN DETAIL
1 1/2" = 1'-0"



2 CURB DETAIL
1 1/2" = 1'-0"



3 PITCH POCKET DETAIL
1 1/2" = 1'-0"

4 CHILLED WATER SUPPLY LINE DETAIL
1 1/2" = 1'-0"

5 ELECTRICAL CONDUIT SUPPORT DETAIL
1 1/2" = 1'-0"

REVISIONS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

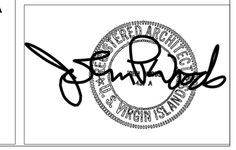
DATE:	06.20.2024
DRAWN BY:	B.J.S.
CHECKED BY:	J.P.W.
APPROVED BY:	J.P.W.

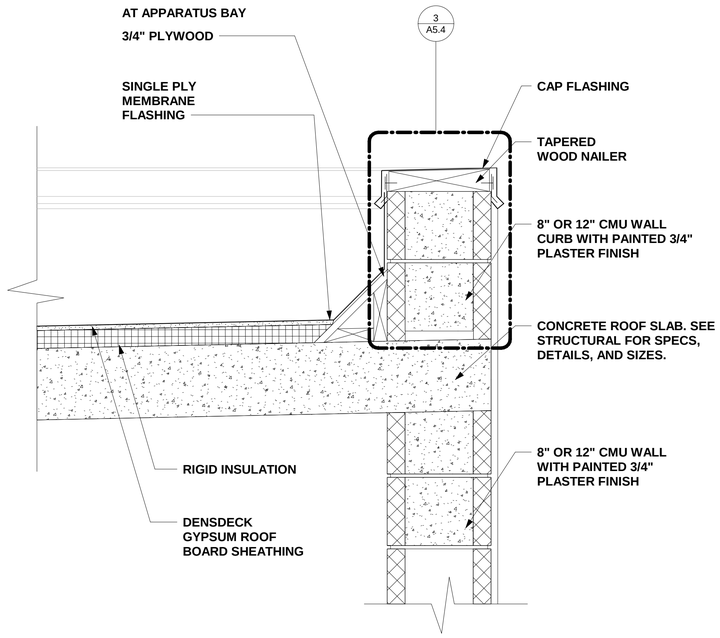
PROJECT NO.: 23-005.E

CONTRACT NO.: -

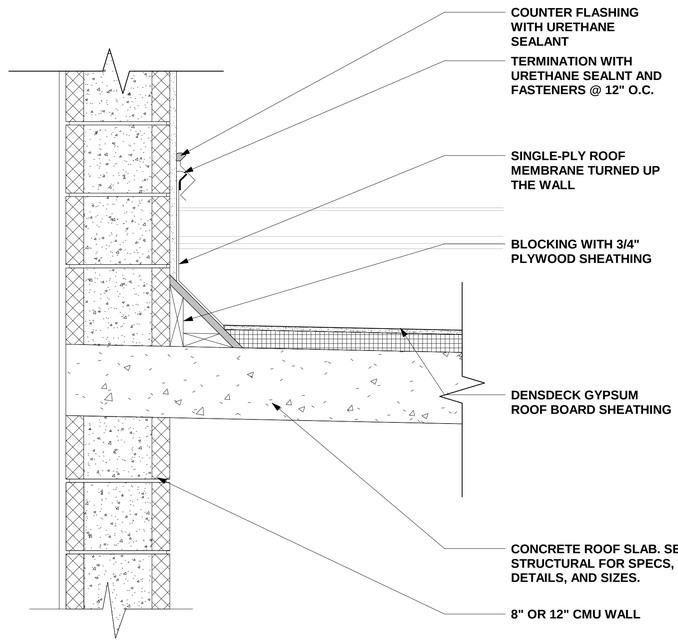
SHEET NO.: A5.2

ROOF DETAILS

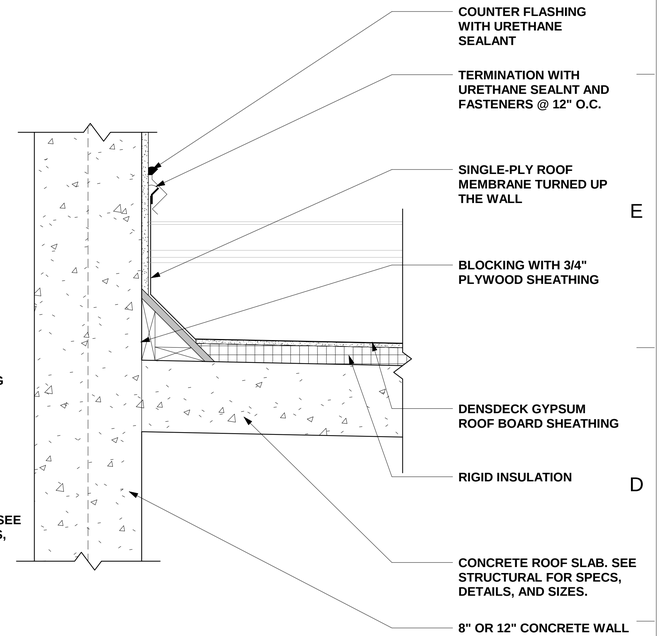




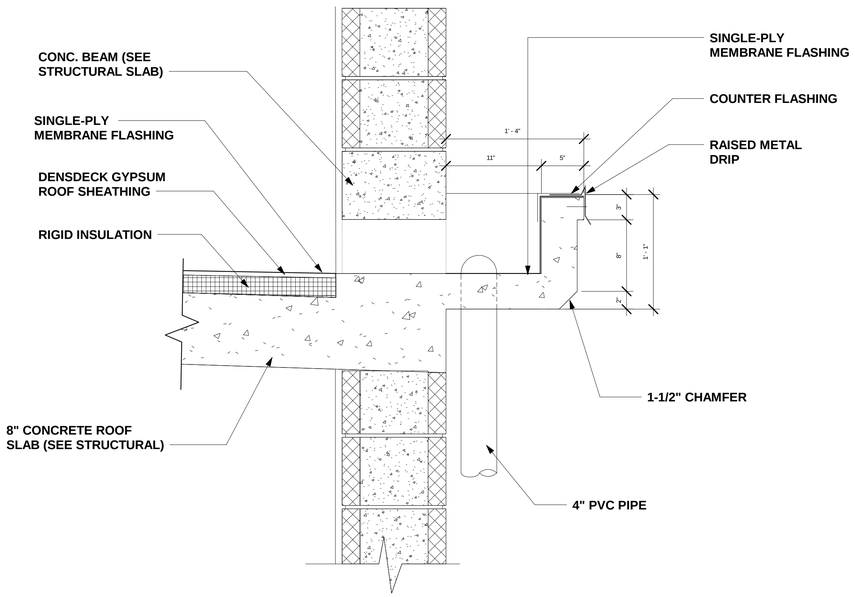
1 ROOF SECTION AT CMU CURB
1 1/2" = 1'-0"



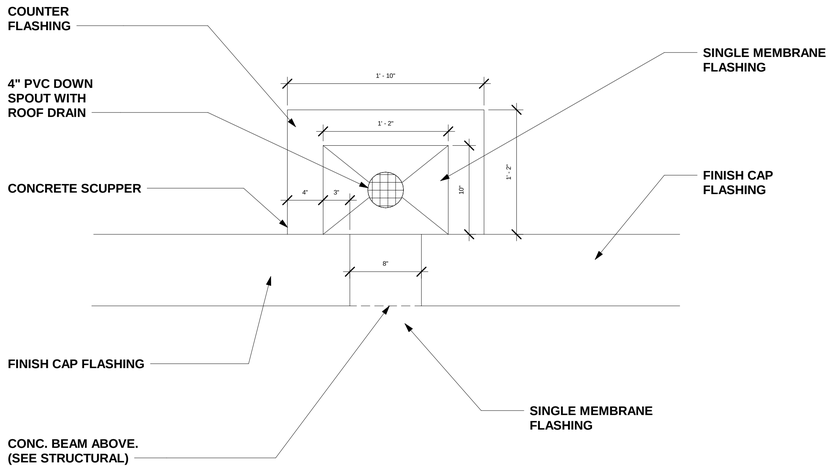
2 ROOF SECTION
1 1/2" = 1'-0"



3 ROOF SECTION AT CONCRETE WALL
1 1/2" = 1'-0"



4 ROOF SECTION AT SCUPPER DRAIN DETAIL
1 1/2" = 1'-0"



5 ROOF SECTION AT SCUPPER - PLAN VIEW
1 1/2" = 1'-0"

REVISIONS		
NO.	DATE	REMARKS

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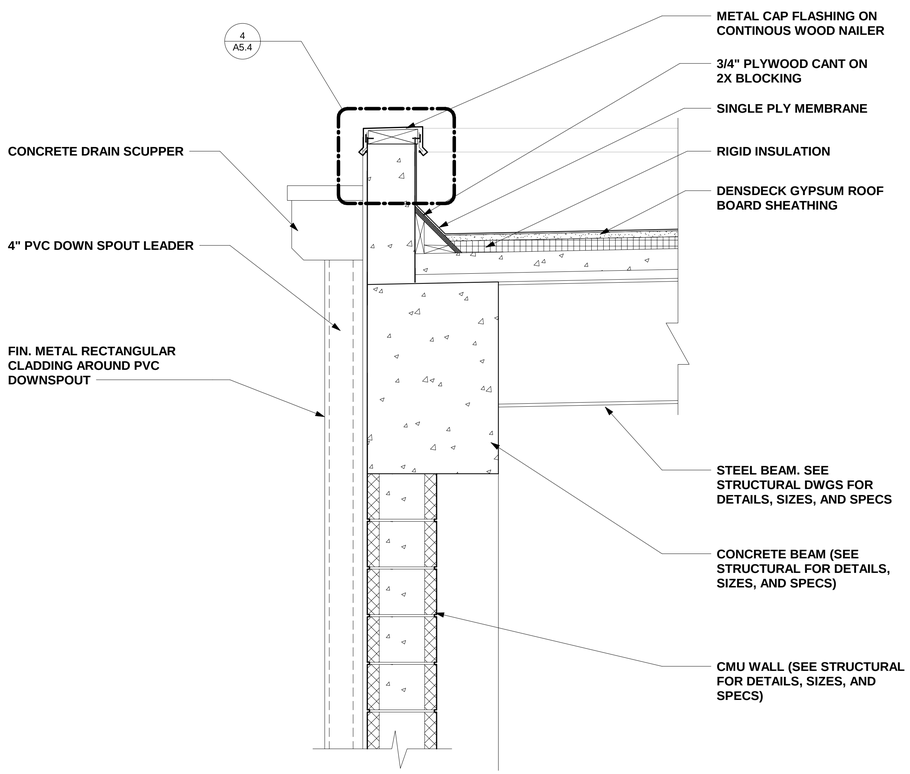
ESTATE FORTUNA (TANGO CO.) FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE:	06.20.2024
DRAWN BY:	B.J.S.
CHECKED BY:	J.P.W.
APPROVED BY:	J.P.W.
PROJECT NO.:	23-005.E
CONTRACT NO.:	-
SHEET NO.:	A5.3

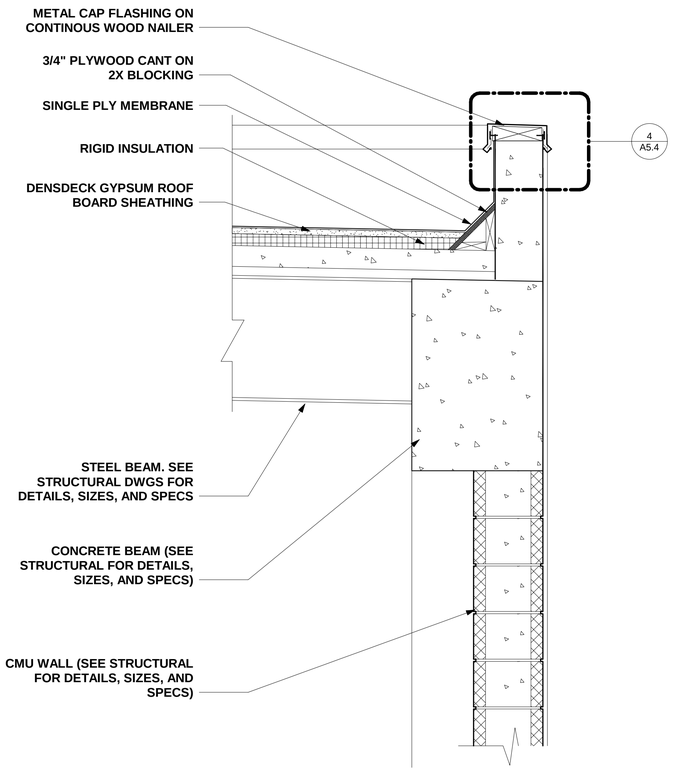
ROOF DETAILS

LICENSED ARCHITECT U.S. VIRGIN ISLANDS



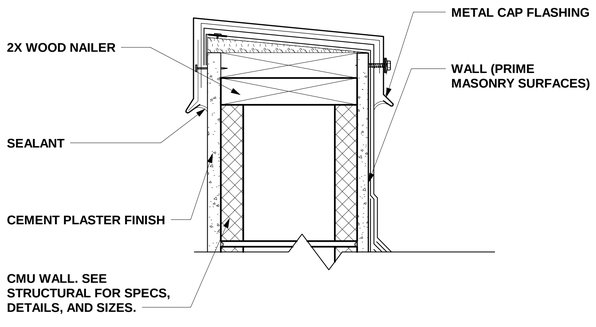
1 ROOF DETAIL WITH CONCRETE SCUPPER

1" = 1'-0"



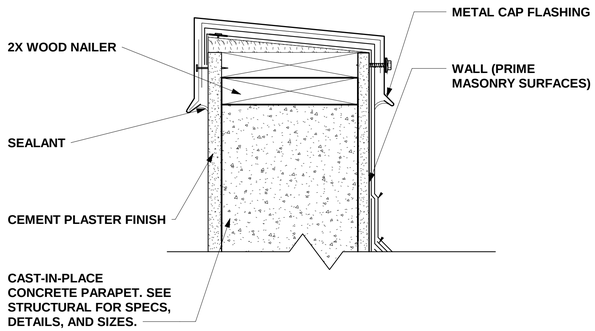
2 ROOF DETAIL WITH CONCRETE BEAM

1" = 1'-0"



3 CMU PARAPET CAP FLASHING DETAIL

3" = 1'-0"



4 CONCRETE PARAPET CAP FLASHING DETAIL

3" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

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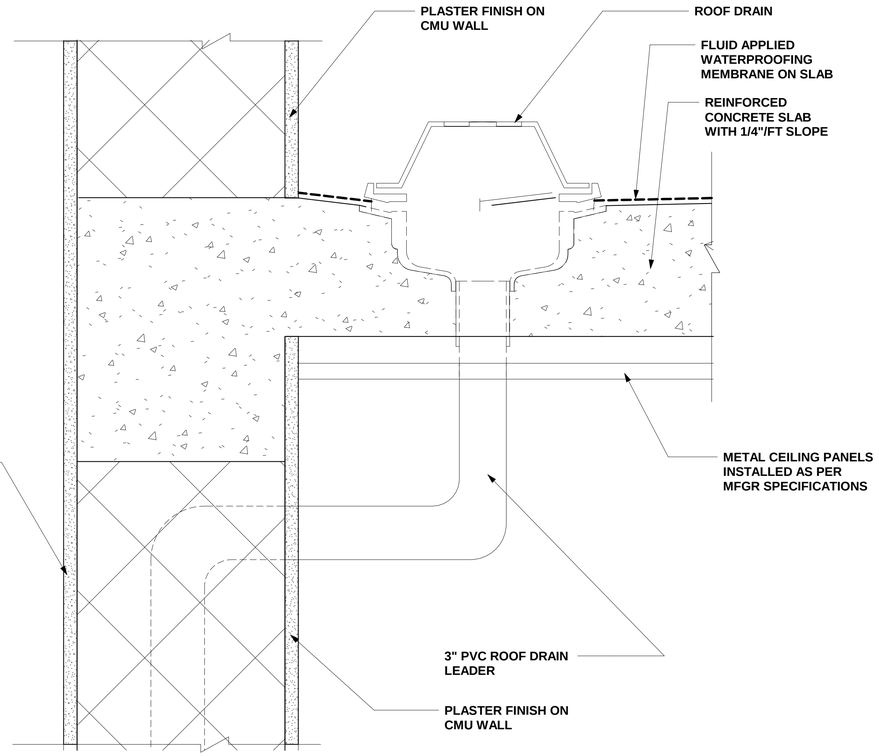
ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE:	06.20.2024
DRAWN BY:	B.J.S.
CHECKED BY:	J.P.W.
APPROVED BY:	J.P.W.
PROJECT NO.:	23-005.E
CONTRACT NO.:	-
SHEET NO.:	A5.4

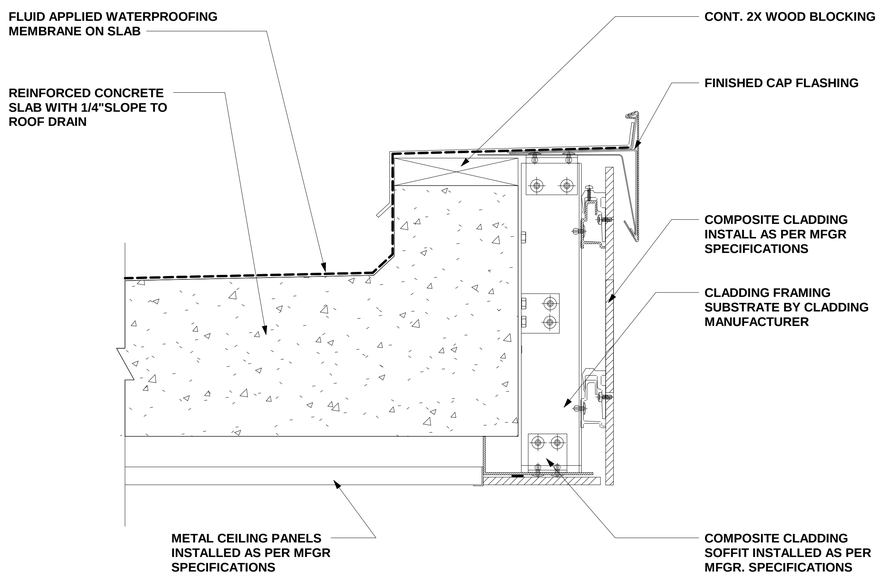
ROOF DETAILS

REGISTERED ARCHITECT J.P.W. U.S. VIRGIN ISLANDS



1 WALKWAY ROOF DRAIN DETAIL

3" = 1'-0"



2 WALKWAY ROOF SLAB DETAIL

3" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.) FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE:	06.20.2024
DRAWN BY:	B.J.S.
CHECKED BY:	J.P.W.
APPROVED BY:	J.P.W.

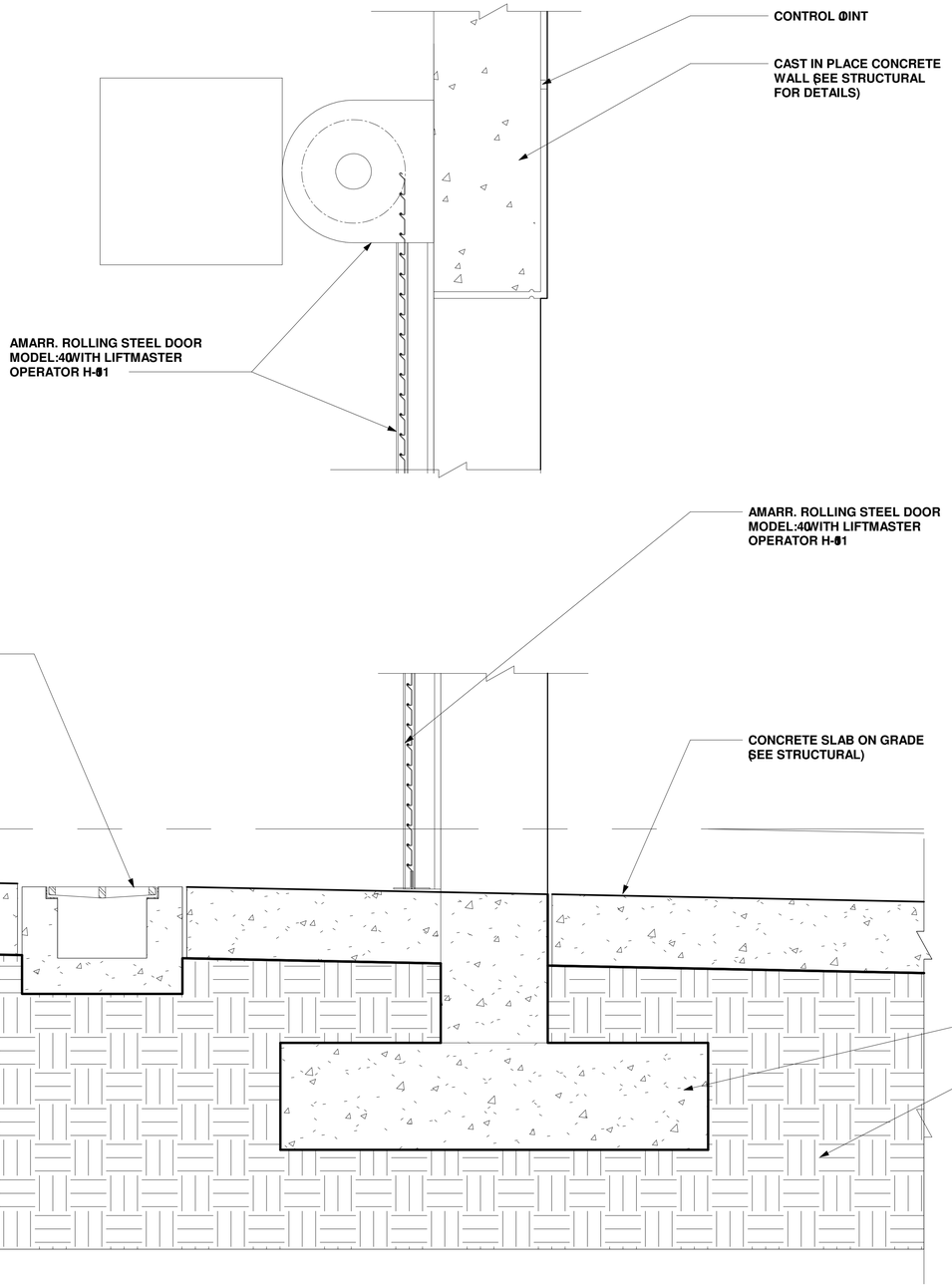
PROJECT NO.: 23-005.E

CONTRACT NO.: -

SHEET NO.: A5.5

ROOF DETAILS





1 OVERHEAD COILING DOOR DETAIL

1" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE: 06.20.2024

DRAWN BY: B.J.S.

CHECKED BY: J.P.W.

APPROVED BY: J.P.W.

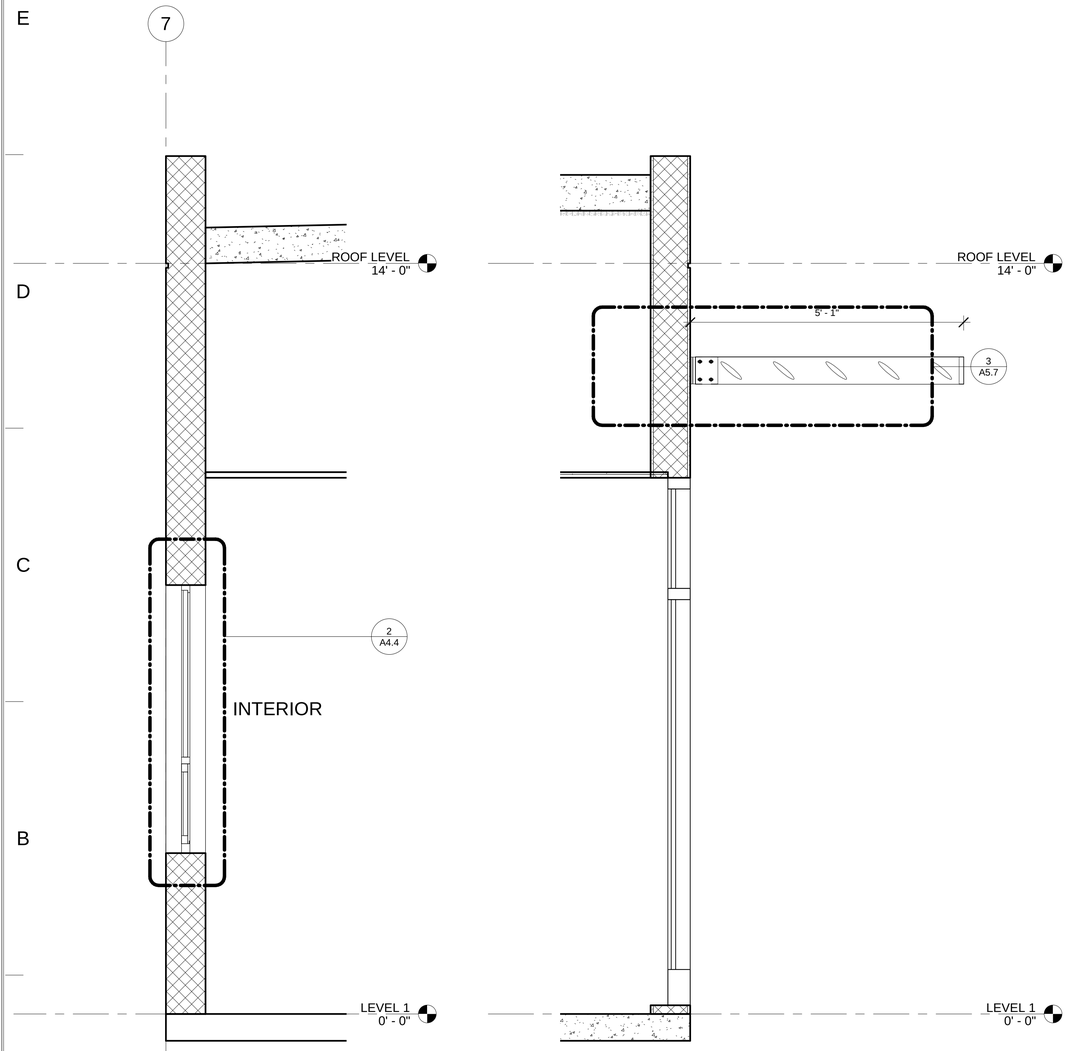
PROJECT NO.: 23-005.E

CONTRACT NO.: -

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DOOR DETAILS

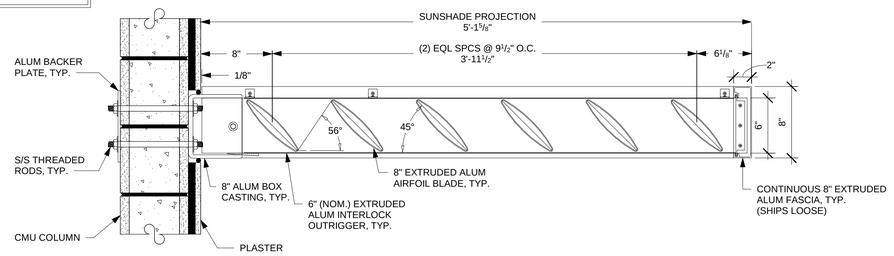
REGISTERED ARCHITECT
U.S. VIRGIN ISLANDS



1 WALL SECTION AT DORM WINDOW
3/4" = 1'-0"

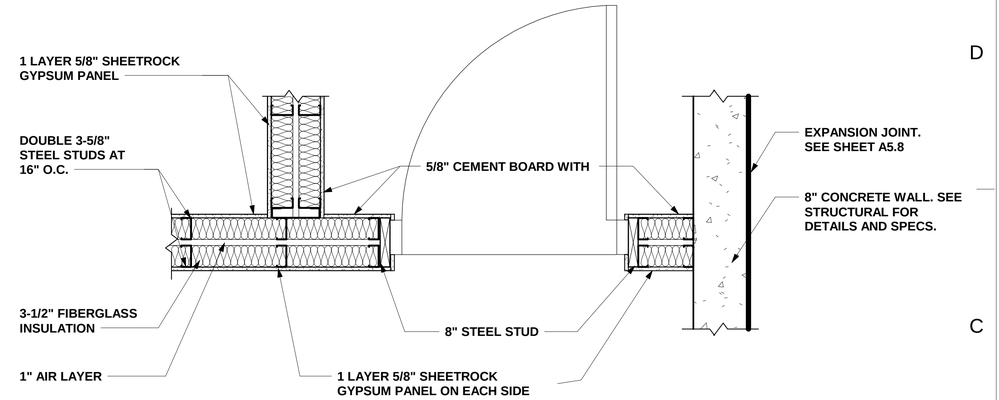
2 WALL SECTION AT ENTRY
3/4" = 1'-0"

WALL CONDITION IS ASSUMED



SECTION VIEW DETAIL OF CUSTOM CANTILEVER AIRFOIL SUNSHADE SYSTEM

3 TYPICAL SUNSHADE DETAIL
1 1/2" = 1'-0"



4 WALL CONNECTIONS
1" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

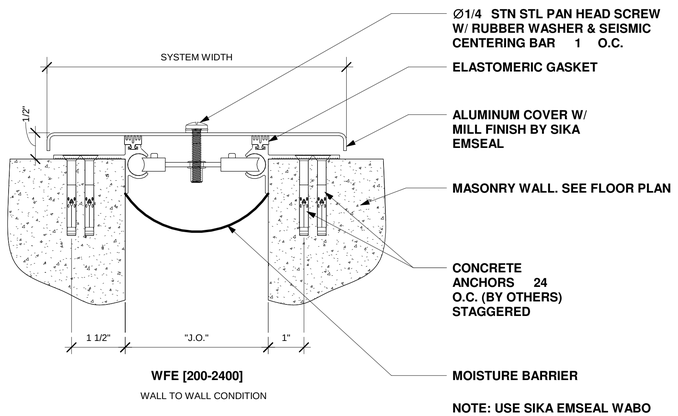
DATE: 06.20.2024
DRAWN BY: B.J.S.
CHECKED BY: J.P.W.
APPROVED BY: J.P.W.

PROJECT NO.: 23-005.E
CONTRACT NO.: -

SHEET NO.: A5.7

WALL SECTIONS

REGISTERED ARCHITECT U.S.A. VIRGIN ISLANDS



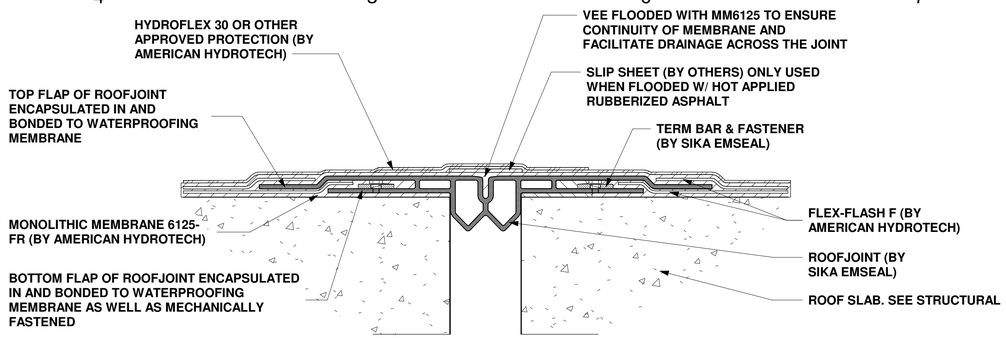
WFE [200-2400]

WALL TO WALL CONDITION

NOTE: USE SIKA EMSEAL WABO EXPANSION JOINT OR SIMILAR

1 EXPANSION JOINT DETAIL @ MASONRY WALL

N.T.S.



NOTES:
1. SLIP SHEET CAN BE A STRIP OF FLEX-FLASH F OR POLYETHYLENE PLASTIC SHEET PLACED OVER THE INSTALLED MM6125. THIS WILL ALLOW FOR FREE MOVEMENT OF THE EXPANSION JOINT SYSTEM AND MM6125 UNDER THE PROTECTION SHEET.
2. LAPS OF THE PROTECTION SHEET SHOULD TAKE PLACE OVER THE JOINT AND LEFT DRY FOR FREE MOVEMENT

MATERIAL	INSTALLATION WIDTH
RJ-0200	2-3 IN
RJ-0400	3-5 IN
RJ-0600	5-7 IN
RJ-0800	7-9 IN

SIKA EMSEAL

ROOFJOINT-FLUID APPLIED WATERPROOFING-FLOODED W/ MM6125

2 EXPANSION JOINT DETAIL @ ROOF SLAB

N.T.S.

FNB [200C-400C]

DECK TO WALL CONDITION

3 EXPANSION JOINT DETAIL - WALL TO SLAB

N.T.S.

REVISIONS

NO.	DATE	REMARKS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE: 06.20.2024

DRAWN BY: B.J.S.

CHECKED BY: J.P.W.

APPROVED BY: J.P.W.

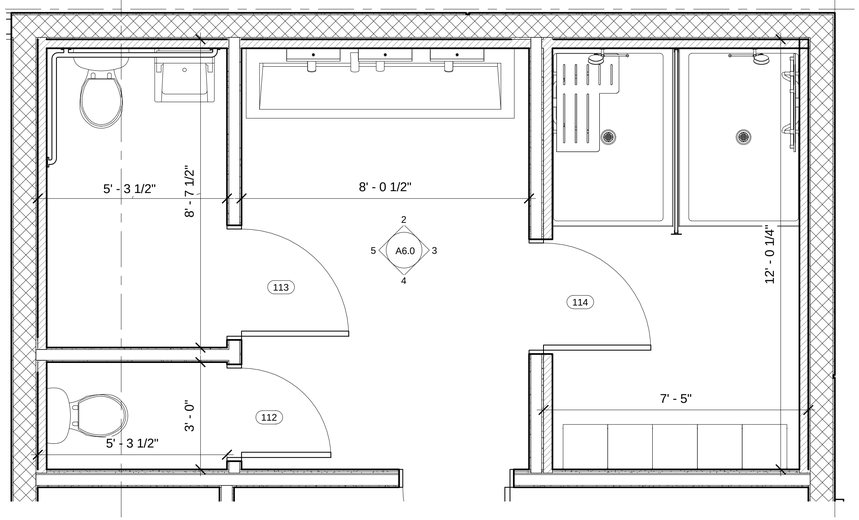
PROJECT NO.: 23-005.E

CONTRACT NO.: -

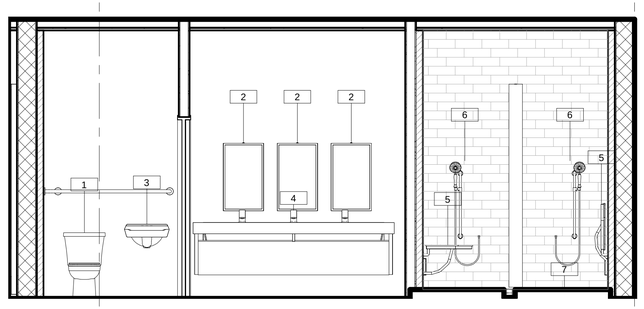
SHEET NO.: A5.8

DETAILS

REGISTERED ARCHITECT U.S.A. VIRGIN ISLANDS



1 ENLARGED PLAN - FEMALE BATHROOM
1/2" = 1'-0"

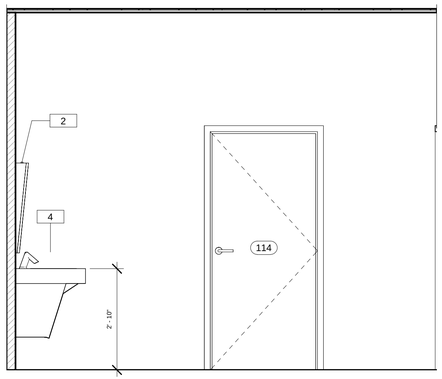


2 FEMALE BATHROOM - ELEVATION 2
3/8" = 1'-0"

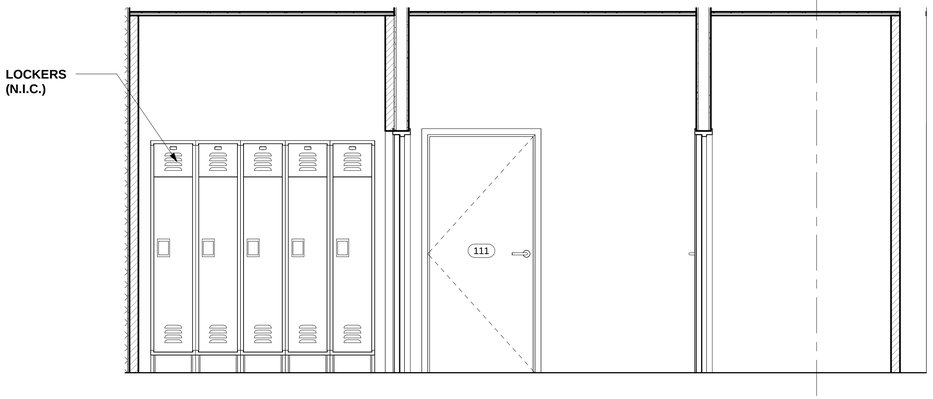
NEW BOBRICK B-2012 SOAP DISPENSER OR SIMILAR

RESTROOM ACCESSORIES LEGEND

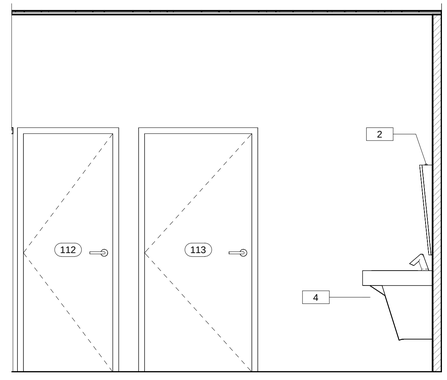
1	NEW KOHLER ULTRA K-25097 TOILET OR SIMILAR ADA COMPLIANT FLOOR MOUNTED TOILET
2	NEW BOBRICK B-293 TILTED MIRROR OR SIMILAR
3	NEW KOHLER GREENWICH K-12643 SINK OR SIMILAR ADA COMPLIANT WALL HUNG SINK
4	NEW SLOAN AD 83000 LAVATORY OR SIMILAR ADA COMPLIANT LAVATORY
5	NEW BOBRICK SHOWER SEAT OR SIMILAR
6	NEW KOHLER HANDHELD SHOWER OR SIMILAR
7	NEW KOHLER SHOWER BASE OR SIMILAR
8	NEW SLOAN WEUS 1002.1401 URINAL OR SIMILAR ADA COMPLIANT WALL HUNG URINAL
9	NEW SLOAN AD 82000 LAVATORY OR SIMILAR ADA COMPLIANT WALL HUNG SINGLE SINK
10	NEW BOBRICK B-68137 OR SIMILAR ADA COMPLIANT GRAB BAR
11	NEW SLOAN AD 81000 LAVATORY OR SIMILAR ADA COMPLIANT WALL HUNG SINGLE SINK
12	NEW SCRANTON MOUNTED PRIVACY SCREEN PILASTER OR SIMILAR



3 FEMALE BATHROOM - ELEVATION 3
1/2" = 1'-0"



4 FEMALE BATHROOM - ELEVATION 4
1/2" = 1'-0"



5 FEMALE BATHROOM - ELEVATION 5
1/2" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN
ISLANDS

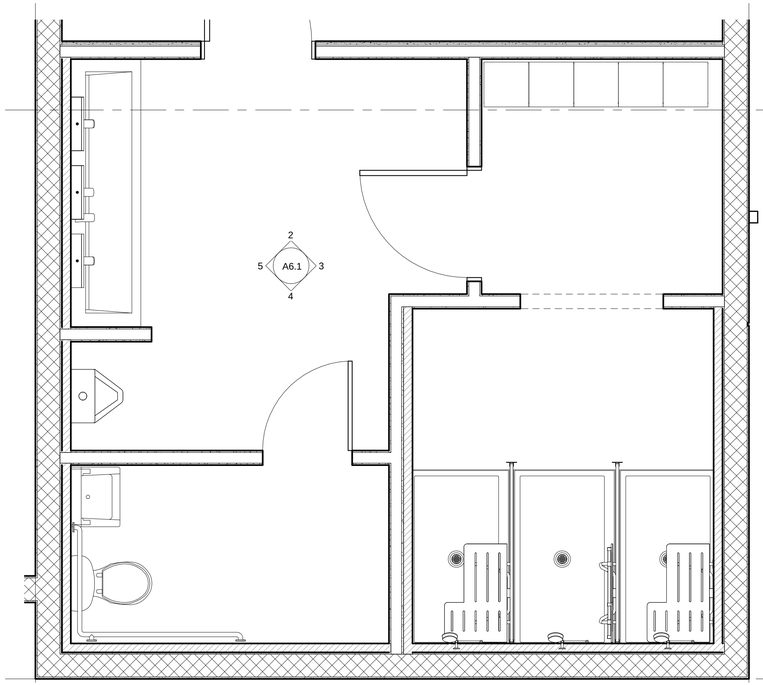
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PROJECT NO.: 23-005.E
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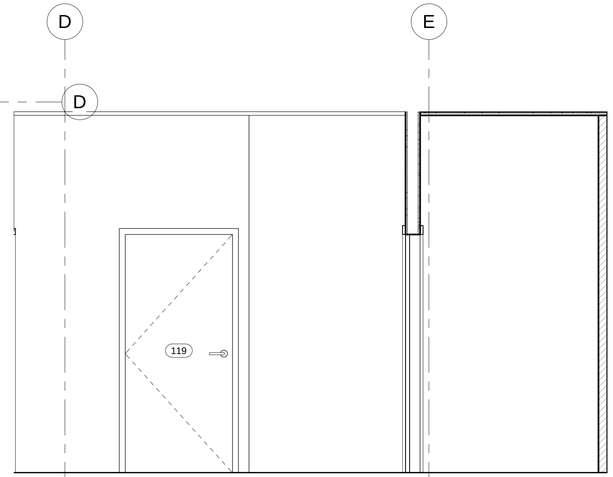
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ENLARGED FEMALE BATHROOM PLANS AND ELEVATIONS

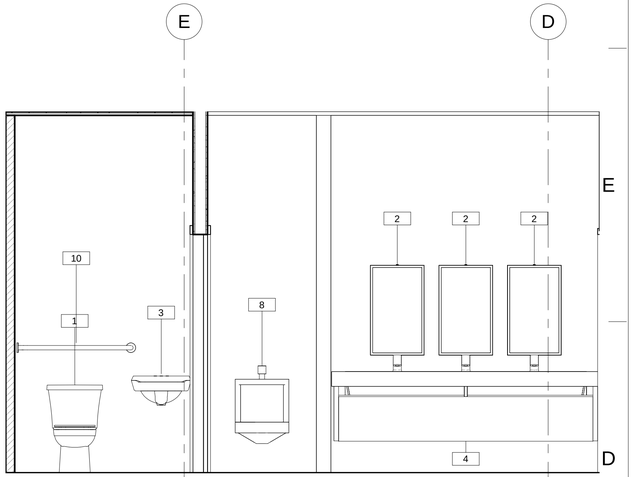
LICENSED ARCHITECT
U.S. VIRGIN ISLANDS
USA



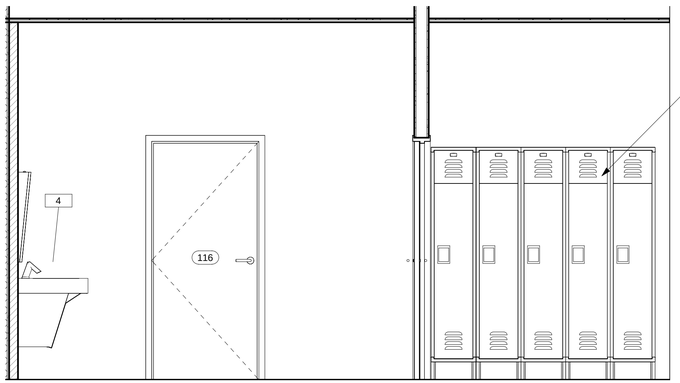
1 ENLARGED PLAN - MALE BATHROOM
1/2" = 1'-0"



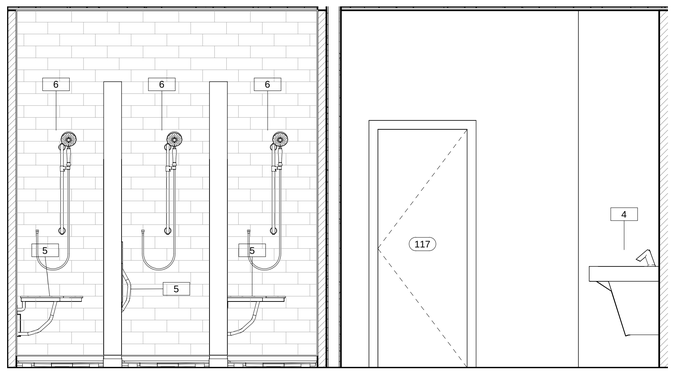
3 MALE RESTROOM - ELEVATION 3
1/2" = 1'-0"



5 MALE RESTROOM - ELEVATION 5
1/2" = 1'-0"



2 MALE BATHROOM - ELEVATION 2
1/2" = 1'-0"



4 MALE RESTROOM - ELEVATION 4
1/2" = 1'-0"

NEW BOBRICK B-2012 SOAP DISPENSER OR SIMILAR

RESTROOM ACCESSORIES LEGEND

1	NEW KOHLER ULTRA K-25097 TOILET OR SIMILAR ADA COMPLIANT FLOOR MOUNTED TOILET
2	NEW BOBRICK B-293 TILTED MIRROR OR SIMILAR
3	NEW KOHLER GREENWICH K-12643 SINK OR SIMILAR ADA COMPLIANT WALL HUNG SINK
4	NEW SLOAN AD 83000 LAVATORY OR SIMILAR ADA COMPLIANT LAVATORY
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REVISIONS

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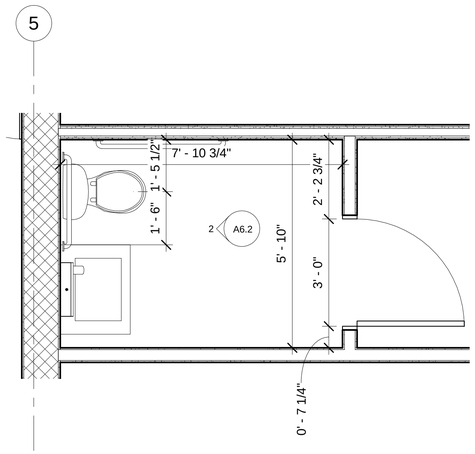
ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

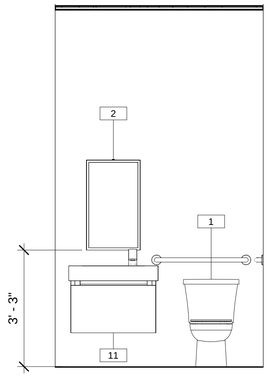
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ENLARGED MALE BATHROOM
PLANS AND ELEVATIONS

LICENSED ARCHITECT
U.S. VIRGIN ISLANDS



1 ENLARGED PLAN - LOBBY RESTROOM
1/2" = 1'-0"

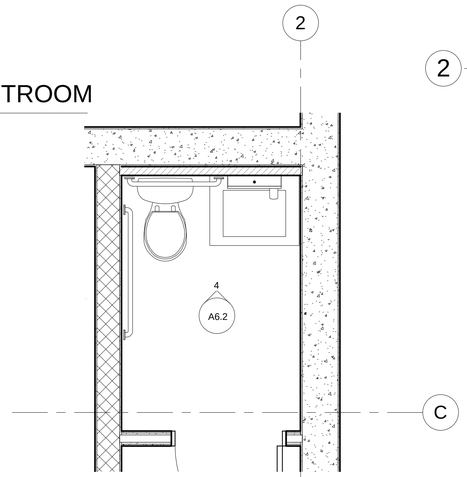


2 LOBBY ELEVATION - ELEVATION 2
1/2" = 1'-0"

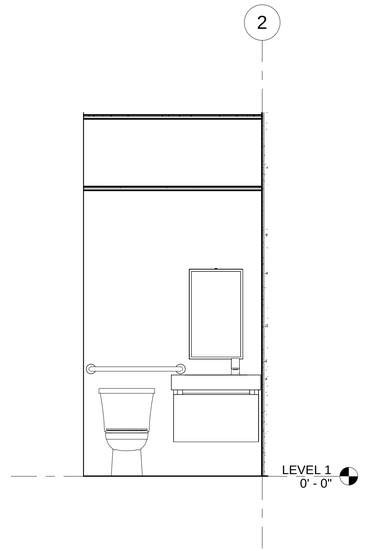
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3 ENLARGED PLAN -SAFE ROOM RESTROOMS
1/2" = 1'-0"



4 TYPICAL SAFE ROOM RESTROOMS
1/2" = 1'-0"

REVISIONS

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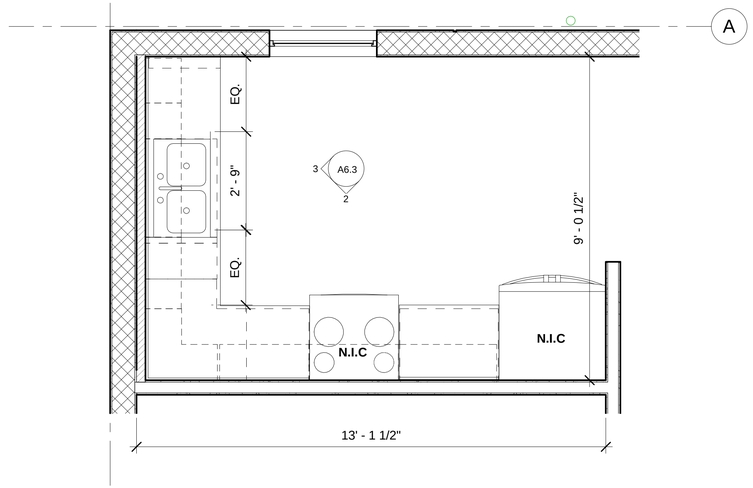
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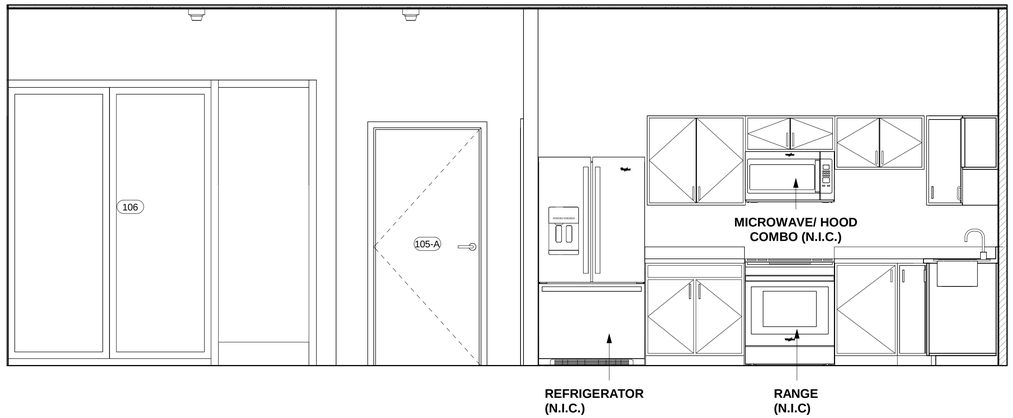
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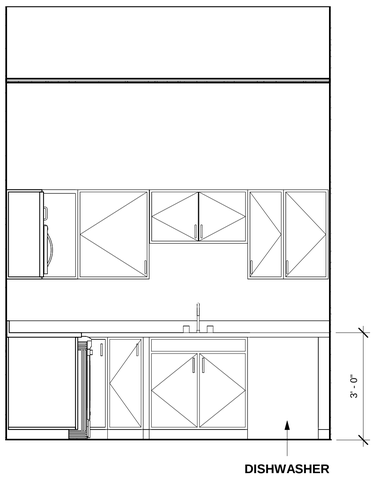
ENLARGED BATHROOM PLAN AND ELEVATIONS



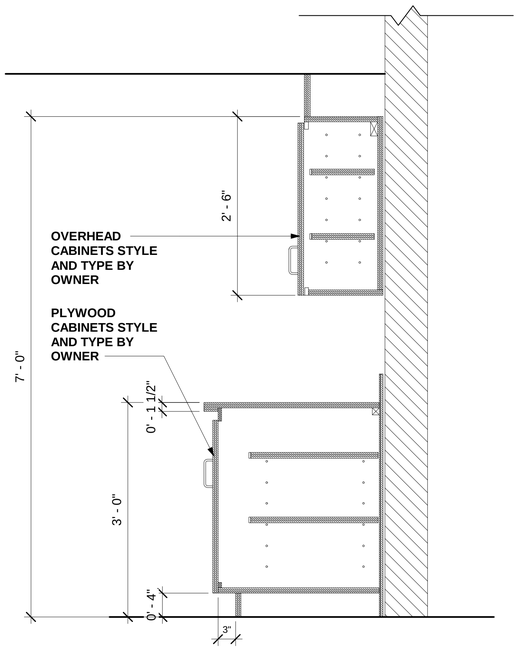
1 ENLARGED PLAN - KITCHEN
1/2" = 1'-0"



2 KITCHEN ELEVATION - 2
1/2" = 1'-0"



3 KITCHEN ELEVATION -3
1/2" = 1'-0"



4 CASEWORK SECTION
1" = 1'-0"

REVISIONS

NO.	DATE	REMARKS

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CONTRACT NO.: -

SHEET NO.: A6.3

ENLARGED KITCHEN PLAN AND ELEVATIONS



ABBREVIATIONS

A/C	ABOVE CEILING
AD	ACCESS DOOR
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AUTO	AUTOMATIC
AC	AIR CONDITIONING
AHU	AIR HANDLING UNIT
ALSD	ARCHITECTURAL LINEAR SLOT DIFFUSER
ALRS	ARCHITECTURAL LINEAR RETURN SLOT
ALES	ARCHITECTURAL LINEAR EXHAUST SLOT
BAL	BALANCING
BDD	BACKDRAFT DAMPER
B/F	BELOW FLOOR
B/G	BELOW GRADE
BFLY	BUTTERFLY
BHP	BRAKE HORSEPOWER
BCO	BASE CLEANOUT
CFM	CUBIC FEET PER MINUTE
CBCR	CURVED BLADE CEILING REGISTER
CD	CEILING DIFFUSER
CU	CONDENSING UNIT
CW	COLD WATER (DOMESTIC)
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
CON	CONCENTRIC
CO	CLEANOUT
COND	CONDENSATE
db	DRY BULB
DN	DOWN
DR	DRAIN
do	DITTO
dB	DECIBELS
DWG	DRAWING
EA	EACH
EAT	ENTERING AIR TEMPERATURE
ECC	ECCENTRIC
EF	EXHAUST FAN
EOD	EMERGENCY OVERFLOW DRAIN
ER	EXHAUST REGISTER
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EFF	EFFICIENCY
F	FAHRENHEIT
FCO	FLOOR CLEANOUT
FCU	FAN COIL UNIT
FSD	FIRE/SMOKE DAMPER
FD	FIRE DAMPER OR FLOOR DRAIN
FL DR	FLOOR DRAIN (only)
FLR	FLOOR
FOB	FLAT ON BOTTOM
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOT	FLAT ON TOP
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
G	GATE
GA	GAUGE
GPM	GALLONS PER MINUTE
GL	GLOBE
GCO	GRADE CLEANOUT
HD	HUB DRAIN
HP	HORSEPOWER
HTG	HEATING
HW	HOT WATER (DOMESTIC)
HWR	HOT WATER RETURN
HWRR	HOT WATER REVERSE RETURN
HWS	HOT WATER SUPPLY
Hz	HERTZ
ID	INSIDE DIMENSION
IN	INCHES
KW	KILOWATTS
LAT	LEAVING AIR TEMPERATURE
LB	POUNDS
LG	LINEAR GRILLE
LRG	LINEAR RETURN GRILLE
LWR	LOOP WATER RETURN
LWS	LOOP WATER SUPPLY
MIN	MINIMUM
MAX	MAXIMUM
MD	MANUAL DAMPER
MOD	MOTOR OPERATED DAMPER
MFR	MANUFACTURER
NC	NORMALLY CLOSED
NG	NATURAL GAS
NFWH	NON-FREEZE WALL HYDRANT
NO	NORMALLY OPEN
NOM	NOMINAL
OA	OUTSIDE AIR
OD	OUTSIDE DIMENSION
OBD	OPPOSED BLADE DAMPER
PIU	POWERED INDUCTION UNIT
PSI	POUNDS PER SQUARE INCH
RA	RETURN AIR
RAD	RADIUS
RAG	RETURN AIR GRILLE
RED	REDUCER
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
RAR	RETURN AIR REGISTER
SP	STATIC PRESSURE
SPS	STATIC PRESSURE SENSOR
SA	SUPPLY AIR
SAN	SANITARY
SD	SMOKE DAMPER
SEN	SENSIBLE
SQ	SQUARE
SR	SUPPLY REGISTER
ST	STORM
SS	SPLIT SYSTEM
TEMP	TEMPERATURE
TG	TRANSFER GRILLE
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VENT
VA	VALVE
VTR	VENT THRU ROOF
VAV	VARIABLE AIR VOLUME
wb	WET BULB
WC	WATER COLUMN
WHA	WATER HAMMER ARRESTOR
WT	WEIGHT
W	WASTE

LEGEND

- CEILING DIFFUSER
- CEILING RETURN AIR GRILLE or EXHAUST GRILLE
- SIDE-WALL or DUCT MOUNTED REGISTER
- SLOT DIFFUSER
- MANUAL VOLUME DAMPER
- FIRE DAMPER
- TRANSITION
- (T) THERMOSTAT
- (H) HUMIDISTAT
- (CO) CO2 SENSOR
- (N) NIGHT SET-BACK
- (M) MOTOR OPERATED DAMPER
- (J) ELECTRICAL J-BOX
- ACCESS PANEL
- EXISTING WORK
- NEW WORK
- WORK TO BE REMOVED

FAN SCHEDULE

I.D. TAG	SERVES	CAPACITY (CFM)	S.P. (IN. W.G.)	MOTOR H.P.	DRIVE	MAX. FAN RPM	MAX. NOISE	VOLTS/ PHASE	TYPE OF FAN	WEIGHT (LBS).	BASIS OF DESIGN	REMARKS
TEF-1	MEN'S RR	250	0.375	fract	D	1,050	3.3 Sones	120/1	INLINE CABINET	25	GREENHECK CSP-A390-VG	(1) (3)
TEF-2	WOMEN'S RR	250	0.375	fract	D	1,050	3.3 Sones	120/1	INLINE CABINET	25	GREENHECK CSP-A390-VG	(1) (3)
TEF-3	RR 103/TURN-OUT	225	0.375	fract	D	1,130	1.3 Sones	120/1	INLINE CABINET	25	GREENHECK CSP-A390-VG	(1) (4)
TEF-4	RR 130/TURN-OUT GEAR	350	0.375	fract	D	1,305	1.3 sones	120/1	INLINE CABINET	25	GREENHECK CSP-A390-VG	(1) (4)
EF-1	APPARATUS BAY	2,500	0.375	3/4	D	1,133	11.4 Sones	120/1	INLINE CENTRIFUGAL	150	GREENHECK SQ-160	(2) (3) (6)
EF-2	ELECTRICAL RM	200	0.375	fract	D	1,000	3.3 sones	120/1	INLINE CABINET	25	GREENHECK CSP-A390-VG	(1) (5)
EF-3	GENERATOR ROOM	500	0.250	fract	D	1,550	6.2 sones	120/1	INLINE CABINET	35	GREENHECK SQ-90	(2) (5) (6)
EF-4	PUMP ROOM	500	0.250	fract	D	1,550	6.2 sones	120/1	INLINE CABINET	35	GREENHECK SQ-90	(2) (5) (6)

(1) FAN SHALL BE SUSPENDED FROM STRUCTURE. INCLUDE GRAVITY BACKDRAFT DAMPER, HANGING NEOPRENE VIBRATION ISOLATORS, DISCONNECT, POLYPROPYLENE FAN WHEEL AND VARI-GREEN MOTOR OPERATING AT CONSTANT CFM
(2) FAN SHALL BE SUSPENDED FROM STRUCTURE. INCLUDE GRAVITY BACKDRAFT DAMPER, HANGING NEOPRENE VIBRATION ISOLATORS, DISCONNECT IN NEMA 3R ENCLOSURE, ALUMINUM CONSTRUCTION, DIRECT DRIVE MOTOR COVER, PERMATECTOR COATING, AND MODEL VCD CONTROL DAMPER SET TO OPEN WHEN FAN ENERGIZES.
(3) FAN SHALL BE CONTROLLED BY A WALL SWITCH.
(4) FAN SHALL RUN CONTINUOSLY
(5) FAN SHALL BE CONTROLLED BY A LINE VOLTAGE THERMOSTAT MOUNTED NEXT TO LIGHT SWITCH NEAR DOOR.
(6) INCLUDE FAN INLET GUARD

AIR FILTRATION SCHEDULE

I.D. TAG	Size (W x H)	USE	CAPACITY (CFM)	MAX S.P.D. (IN. W.G.)	HP	VOLTS/ PHASE/HZ	BASIS OF DESIGN	REMARKS
ACD-1	76.5"X26.24.25"X26.25"	FIRE APPARATUS BAYS	3000	0.10	1.00	208/1/60	SAFEAIR MODEL SA-FHAC-3000	(1) (2) (3)
ACD-2	76.5"X26.25"X26.25"	FIRE APPARATUS BAYS	3000	0.10	1.00	208/1/60	SAFEAIR MODEL SA-FHAC-3000	(1) (2) (3)

(1) FAN SHALL BE DIRECT DRIVE, FORWARD CURVED. CONSTRUCTION SHALL BE 16 GA STEEL COATED RED. MOUNT AT 14'-0" AFF (OR AS DIRECTED BY AHJ). INCLUDE DISCONNECT (LOCKOUT/TAGOUT TYPE)
(2) INCLUDE MERV 11 PLEATED PRE-FILTER, MERV 14 HEPA MAIN FILTER, CARBON/PURAFIL BLEND GAS FILTER (50LBS), AND MERV 8 PLEATED AFTER FILTER.
(3) INCLUDE 4WD-4E CONTROLLER, LED DIRTY FILTER INDICATOR, PRESSURE SWITCH, AND BIRDSCREEN.

SEQUENCE OF CONTROLS FOR HVAC EQUIPMENT:

1. PROVIDE ALL REQUIRED CONTROLS AND LOW VOLTAGE WIRING REQUIRED FOR A FULLY FUNCTIONAL SYSTEM.
2. SPLIT SYSTEMS SHALL BE CONTROLLED BY A 24/7/365 PROGRAMMABLE THERMOSTAT. DEVICE SHALL BE A COMBINATION HUMIDISTAT/THERMOSTAT.
3. FAN COIL UNIT (FCU) FANS SHALL RUN CONTINUOSLY AND OUTSIDE AIR DAMPERS SHALL BE NORMALLY OPEN TO PROVIDE EXHAUST MAKE-UP AIR. COOLING/DEHUMIDIFICATION CYCLES SHALL OPERATE TO MAINTAIN SPACE HUMIDITY AND TEMPERATURE.

LOUVER SCHEDULE

I.D. TAG	Size (W x H)	USE	CAPACITY (CFM)	FREE AREA REQ (SF)	MAX S.P.D. (IN. W.G.)	BASIS OF DESIGN	REMARKS
L-1	36X24	INTAKE	975	1.77	0.10	RUSKIN HZ700MD	(1)
L-2	16X12	INTAKE	325	0.36	0.10	RUSKIN XP500WD	(1) (2)
L-3	18x16	EXHAUST	450	0.50	0.10	RUSKIN HZ700MD	(1)
L-4	16X12	EXHAUST	250	0.42	0.10	RUSKIN HZ700MD	(1)
L-5	18X16	EXHAUST	300	0.38	0.10	RUSKIN XP500WD	(1) (2)
L-6	60X22	INTAKE	2,500	4.55	0.10	RUSKIN HZ700MD	(1)
L-7	60X22	EXHAUST	2,725	4.95	0.10	RUSKIN HZ700MD	(1)
L-8	18X16	INTAKE	500	0.50	0.12	RUSKIN XP500WD	(1) (2)
L-9	18X16	EXHAUST	500	0.50	0.12	RUSKIN XP500WD	(1) (2)
L-10	18X16	EXHAUST	500	0.56	0.12	RUSKIN XP500WD	(1) (2)
L-11	18X16	INTAKE	500	0.56	0.12	RUSKIN XP500WD	(1) (2)
L-12	68x86	EXHAUST	10,800	10.80	0.12	RUSKIN XP500WD	(1) (2)
L-13	108X64	INTAKE	12,800	12.80	0.20	RUSKIN XP500WD	(1) (2)
L-14	30X12	INTAKE	150	0.30	0.10	RUSKIN XP500WD	(1) (2) (3)

(1) SEE SPEC SECTION 233723
(2) LOUVER TO BE ICC 500 AND FEMA P-361 COMPLIANT.
(3) INCLUDE A MANUAL DAMPER BEHIND EACH LOUVER, ACCESSIBLE BY OCCUPANTS. DAMPERS ARE FOR PASSIVE VENTILATION IN THE EVENT THE GENERATOR POWER FAILS.

SPLIT SYSTEM SCHEDULE

I.D. TAG	AREA SERVED	ORIENATION	HAP CAPACITY MINIMUM TOTAL CAPACITY (BTUH)	HAP CAPACITY MINIMUM SENSIBLE CAPACITY (BTUH)	BOD CAPACITY MINIMUM TOTAL CAPACITY (MBH)	BOD CAPACITY MINIMUM SENSIBLE CAPACITY (MBH)	FAN COIL UNIT DATA AIRFLOW (CFM)	EXT. S.P. (IN. W.C.) (1)	OUTSIDE AIR (CFM)	MAX H.P.	COIL EAT °F db	COIL EAT °F wb	VOLTS/ PHASE	DRIVE (2)	HEATING DATA HEATING SECTION TYPE	HEATING DATA HEATING SECTION CAPACITY (3)	HEATING DATA WEIGHT (LBS)	CONDENSING UNIT DATA AMBIENT TEMP. (°F)	CONDENSING UNIT DATA VOLTS/ PHASE	CONDENSING UNIT DATA STAGES	CONDENSING UNIT DATA MIN. SEER (4)	CONDENSING UNIT DATA WEIGHT (LBS)	BASIS OF DESIGN	REMARKS
FCU-1 / CU-1	SAFEROOM	HORIZONTAL	35,600	23,100	35,696	23,353	1,005	0.5	325		79.2	68.2	208/1	D	HP	36,562	150	90.0	208/1	1	14.0	200	CARRIER 45MBAAQ36XA3 / 37MBRAQ36AA3	(5) (6)
FCU-2 / CU-2	EQUIP MAINT	DUCTLESS WALL	17,400	15,500	24,000	17,040	800	0.5	0	F	76.7	64.6	208/1	D	HP	25,000	100	90.0	208/1	1	14.0	100	CARRIER 45MAHAQ24XA3 / 37MARAQ24AA3	(7) (8)
FCU-3 / CU-3	OFFICES	VERTICAL	29,200	20,600	31,477	20,602	865	0.5	225		78.8	66.8	208/1	D	HP	32,219	150	90.0	208/1	1	14.0	160	CARRIER 45MBAAQ36XA3 / 37MBRAQ36AA3	(5) (6)
FCU-4 / CU-4	DAYROOM	VERTICAL	34,800	23,100	35,696	23,353	1,085	0.5	250		77.2	67.0	208/1	D	HP	36,562	150	90.0	208/1	1	14.0	200	CARRIER 45MBAAQ36XA3 / 37MBRAQ36AA3	(5) (6)
FCU-5 / CU-5	FEMALE DORM	VERTICAL	22,400	14,200	24,263	18,546	630	0.5	250		80.4	69.6	208/1	D	HP	23,080	150	90.0	208/1	1	14.0	160	CARRIER 45MUAAQ24XX3 / 37MURAQ24AA3	(5) (6)
FCU-6 / CU-6	MALE DORM	VERTICAL	27,200	18,200	32,341	24,454	900	0.5	250		77.8	67.6	208/1	D	HP	22,991	150	90.0	208/1	1	14.0	160	CARRIER 45MUAAQ30XX3 / 37MURAQ30AA3	(5) (6)

(1) THIS IS THE S.P. EXTERNAL TO THE ENTIRE FAN COIL UNIT ASSEMBLY (WET COIL, CASING, CLEAN FILTERS, AND FURNACE LOSSES ARE NOT INCLUDED IN THIS EXT. S.P.).
(2) B = BELT DRIVE, D = DIRECT DRIVE.
(3) THIS IS THE MINIMUM OUTPUT CAPACITY IN HEAT PUMP BTU AT 47 DEG F
(4) RATINGS BASED ON AHRI STANDARDS 210 / 240.
(5) PROVIDE THE FOLLOWING ACCESSORIES FOR THE FAN COIL UNIT: NEOPRENE VIBRATION ISOLATORS, MULT-SPEED EC MOTOR, DEHUMIDIFICATION MODE, INVERTER COMPRESSOR AND PROGRAMMABLE ELECTRONIC COMBINATION THERMOSTAT/HUMIDISTAT.
(6) PROVIDE OUTDOOR UNIT WITH SEA-COAST PAINT PROTECTION, AND WALL MOUNTING ACCESSORY KIT. MOUNTING HEIGHT SHALL BE PER LOCAL CODES AND STANDARDS.
(7) PROVIDE INDOOR UNIT WITH WALL MOUNTING PLATE AND SAUERMAN MEGA PACK MINI-CONDENSATE PUMP. THERMOSTAT SHALL BE REMOTE MOUNTING NEAR DOOR
(8) INDOOR UNIT IS POWERED BY OUTDOOR UNIT

GENERAL SPLIT SYSTEM NOTES:
1. CONTRACTOR SHALL COORDINATE THE REQUIRED SIZING OF ALL REFRIGERANT LINE SETS WITH THE HVAC UNIT MFG.
2. HVAC UNIT MFG. SHALL BE RESPONSIBLE FOR PROVIDING ALL REQUIRED CU AND FCU ACCESSORIES TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
3. HVAC UNIT MFG. SHALL BE RESPONSIBLE FOR REFRIGERANT LINE SIZING INCLUDING ANY REFRIGERANT LINE REQUIREMENTS FOR SLOPING OR TRAPPING TO ENSURE PROPER OIL RETURN AND SYSTEM OPERATION.
4. CONTRACTOR SHALL INSTALL LIQUID LINE FILTER DRIERS IN ALL LINE SETS.
5. CONTRACTOR SHALL ARRANGE UNIT LAYOUT TO ENSURE SERVICEABILITY OF COMPRESSOR AND CONDENSER FAN.

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION
1	09/05/2025	REV 1

CONSULTANTS

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BW&A Job No. 2024-1102

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ESTATE FORTUNA (TANGO CO.) FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

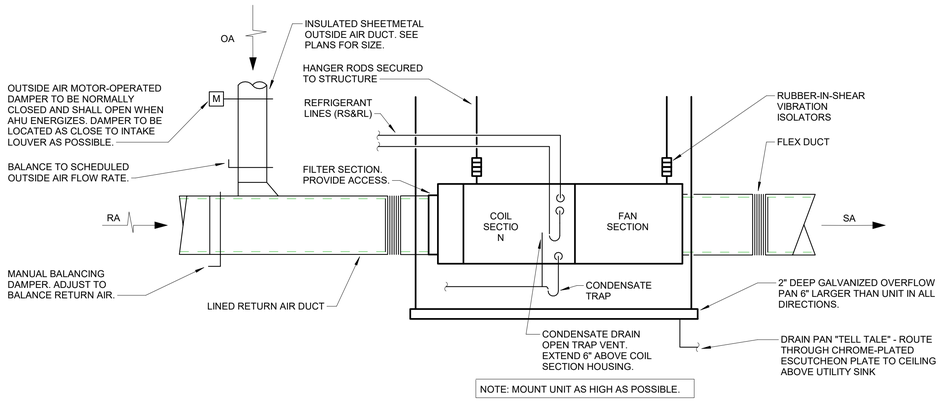
DATE: 03.14.2025
DRAWN BY: A. COBB
CHECKED BY: C. LYLES
APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D
CONTRACT NO.: -

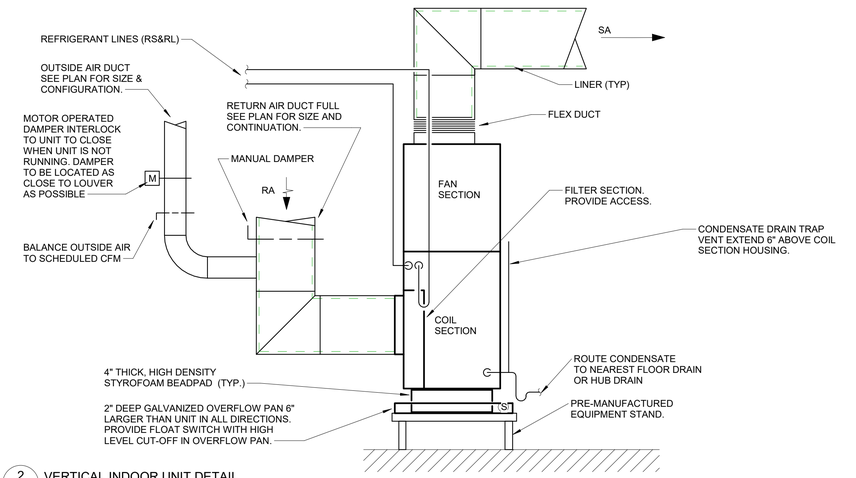
SHEET NO.: M0.1

MECHANICAL ABBREVIATIONS, & SCHEDULES

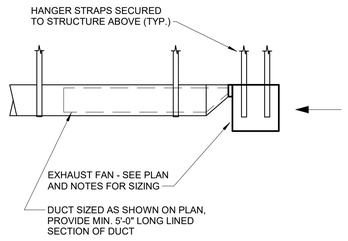
PROFESSIONAL ENGINEER CHRISTOPHER LYLES 17341-E U.S. VIRGIN ISLANDS



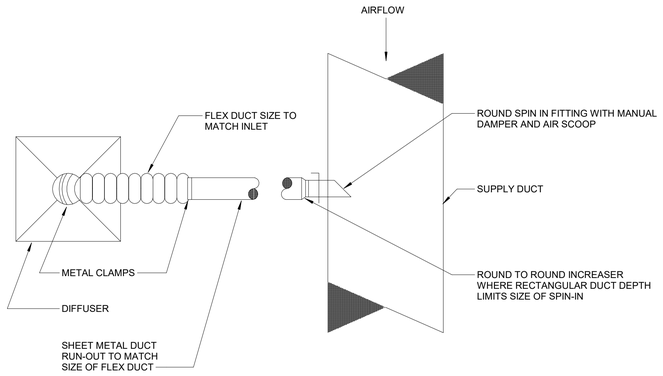
1 M0.2 HORIZONTAL INDOOR UNIT DETAIL
12" = 1'-0"



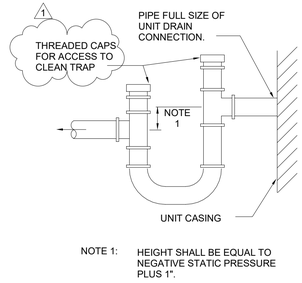
2 M0.2 VERTICAL INDOOR UNIT DETAIL
12" = 1'-0"



3 M0.2 INLINE EXHAUST FAN DETAIL
12" = 1'-0"

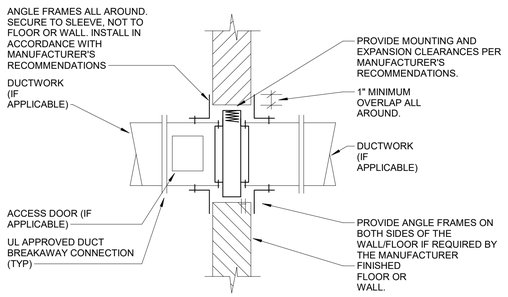


4 M0.2 CONCEALED DIFFUSER CONNECTION
NOT TO SCALE



NOTE 1: HEIGHT SHALL BE EQUAL TO NEGATIVE STATIC PRESSURE PLUS 1".

5 M0.2 CONDENSATE DRAIN TRAP DETAIL
12" = 1'-0"



NOTES:
INSTALLATION SHALL SHALL BE IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND SHALL MAINTAIN THE MANUFACTURER'S UL LISTING.

6 M0.2 FIRE DAMPER DETAIL
NOT TO SCALE

1

AIR BALANCE SCHEDULE

AREA	UNITS	SUPPLY AIR (CFM)	RETURN AIR (CFM)	OUTSIDE AIR (CFM)	EXHAUST AIR AIR (CFM)	NOTES
OFFICES	FCU-3 / TEF-3	865	640	225	-225	TEF-3 runs continuosly
KITCHEN/LIVING	FCU-4 / EF-2	1085	835	250	-200	EF-2 runs intermittently
FEMALE DORM	FCU-5 / TEF-2	630	380	250	-250	TEF-2 runs continuously
MALE DORM	FCU-6 / TEF-1	900	650	250	-250	TEF-1 runs continuously
	TOTALS:	**3480**	**2505**	**975**	**-925**	Bldg is 50 CFM positive (minimum)
Plan Left side	FCU-1 / TEF-4	1005	680	325	-300	TEF-4 runs continuously

OUTSIDE AIR VENTILATION REQUIREMENTS

AREA	FLOOR AREA (SF)	AREA O.A. RATE CFM/SF	TOTAL OCCUPANTS	PPL O.A. RATE (CFM/P)	O.A. REQUIRED (CFM)	O.A. PROVIDED (CFM)
OFFICES (FCU-3)	800	0.06	5	5	73	225
KITCHEN/LIVING (FCU-4)	1020	0.06	10	5	111	250
FEMALE DORM (FCU-5)	575	0.06	5	5	60	250
MALE DORM (FCU-6)	860	0.06	8	5	92	250
Plan Left side (FCU-1)	935	0.06	15	5	131	325

REVISIONS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE: 03.14.2025
DRAWN BY: A. COBB
CHECKED BY: C. LYLES
APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: M0.2

MECHANICAL DETAILS

PROFESSIONAL ENGINEER
CHRISTOPHER LYLES
1751-E
U.S. VIRGIN ISLANDS

SECTION 23 05 00
COMMON WORK RESULTS FOR HVAC

1.0 GENERAL

1.01 DESCRIPTION

A. This Division 23 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the air conditioning, ventilating, heating, fire suppression and plumbing systems as specified herein and as shown.

B. The General Provisions and Division 01, including the general, supplementary and other conditions and other Divisions, as appropriate, apply to work specified in this Division.

1.02 INTENT OF DRAWINGS AND SPECIFICATIONS

A. The implied and stated intent of the drawings and specifications is to establish minimum acceptable standards for materials, equipment and workmanship, and to provide operable mechanical systems complete in every respect.

B. The engineering drawings are diagrammatic, intended to show general arrangement and sizes of system components, and shall not be scaled. Rather, the architectural and structural drawings shall govern space constraints, dimensions and finishes. All offsets and fittings which will be necessary to accomplish the finished installation shall be provided at no additional cost or increase in the Contract.

1.03 SPACE PRIORITY

A. Ensure optimum use of available space for materials and equipment installed above ceilings. Allocate space in the order of priority as listed below except as otherwise detailed. Items are listed in the order of priority, with items of equal importance listed under a single priority number.
1. Gravity flow piping systems
2. Vent piping systems
3. Recessed lighting fixtures
4. Concealed HVAC terminals and equipment
5. Air duct systems
6. Sprinkler piping systems
7. Pressurized piping systems
8. Electrical conduit, wiring, control air tubing

B. Order of space priority does not dictate installation sequence. Installation sequence shall be as required to install all affected trades.

C. The work of this Division 23 shall not obstruct access for installation, operation and maintenance of the work of any other Division.

D. All major items of equipment shall be arranged so as to provide a minimum of 28" clear aisle space. Additional space shall be provided between and around equipment for maintenance and proper operation as shown in the Equipment Manufacturer's literature.

1.04 COORDINATION

A. Coordinate all work under this Division 23 with work under all other Divisions, providing adjustment as necessary.

B. Coordination of space requirements with respect to Division 26 shall be performed such that:

1. No equipment, piping or ductwork, other than electrical, shall be installed within 42" of switchboards or panelboards.

2. No piping or ductwork which ever operates at a temperature in excess of 120°F shall be installed within 3" of any electrical conductor.

C. All items mounted in or below the ceiling, and all items penetrating the ceiling, shall be coordinated with the architectural reflected ceiling plans. If any items are not shown on these plans, or any items need to be relocated for coordination purposes, prepare a reflected ceiling plan and submit it to the Architect for approval.

D. Variable-Frequency Drives shall be provided under Division 23 and installed by Division 26. See specification 26 29 23 Variable - Frequency Motor Controllers.

E. Fused disconnects shall be provided under this Division 23 for all equipment connected directly to bus duct, and rating shall match bus duct rating. Coordinate with Division 26.

1.05 CODE COMPLIANCE

A. All workmanship and materials provided under this Division 23 shall comply with all laws, ordinances, codes and regulations of all Federal, State and Local Authorities Having Jurisdiction.

B. All fire suppression, plumbing, heating, ventilating, and air conditioning materials and workmanship shall comply with all local, state and federal codes.

C. Secure and pay all fees associated with all permits and licenses required for execution of the Contract. Arrange for all inspections required by City, County, State and other Authorities Having Jurisdiction, and deliver certificates of approval to the Architect.

D. The code requirements are strictly a minimum and shall be met without incurring additions to the Contract. Where requirements of the drawings or specifications exceed the code requirements, the work shall be provided in accordance with these drawings or specifications. In the event of conflict or ambiguity between the various codes, the most stringent requirement shall govern.

1.06 ELECTRICAL REQUIREMENTS AND INTERFACE

A. All electrical equipment and wiring provided under this Division 23 shall comply with the electrical system characteristics indicated on the electrical drawings and specified in Division 26.

B. Electric controls, contactors, starters, pilot lights, push buttons, etc., shall be provided complete as part of the motor, heater or other equipment which it operates. All electrical components shall be in conformance with the requirements of the National Electrical Code and Division 26. Starters shall be wye-delta, closed transition type. Reference Division 26 and the electrical engineering drawings for those motor starters provided under that Division 26. All starters not shown shall be provided under this Division 23. Unless specified otherwise under other individual equipment Sections, motor starters shall conform to the following minimum requirements:

1. Starters for motors 1/3 horsepower or smaller shall be manual unless remote or automatic starting is required, in which case the starters shall be magnetic, full voltage, non-reversing, single-speed, unless otherwise indicated. All other starters shall be magnetic.

2. Each starter for a three-phase motor shall be furnished with three (3) overload relays sized for the full load running current of the motor actually provided. Provide an external "HAND-OFF-AUTO" selector switch with red "RUNNING" light. Provide a green pilot light to indicate motor "STOPPED". Each pilot light shall have a legend plate indicating reason for signal.

3. Each overload relay shall have a normally open alarm contact which will close only when actuated by an overload (not to be confused with N.O. or N.C. auxiliary contacts). These contacts shall be properly wired to their respective blue pilot light provided on the starter front cover and having a "TRIPPED" legend plate.

4. Individually mounted motor starters shall be in a NEMA Type 1 general purpose enclosure in unfinished areas and shall be flush mounted in all finished areas. All starters mounted in exterior areas shall have a NEMA 3R enclosure. Each starter shall have a laminated nameplate to indicate equipment unit number, function and circuit number.

5. All motor starters, push buttons and pilot lights shall be of the same Manufacturer as the switchboard and shall be General Electric, Square D, Siemens I.T.E., or Westinghouse.

C. Motor starters for the following equipment shall be provided under this Division 23 by the Manufacturer of the equipment:
1. Packaged air conditioning equipment
2. Water chillers
3. Other equipment hereinafter specified in other Sections to be provided with integral starters

D. Unless otherwise noted or specified in individual Sections, all 3-phase motors shall be standard NEMA continuous duty "B" type, with Class B insulation, open drip-proof frame for indoor service, TEFC for outdoor service and a service factor of 1.15. All motors 5 HP and larger shall be U.S. Motors Hi-Efficiency Model or Reliance XE Hi-Efficiency Model.

E. All power wiring and final connections to equipment shall be provided under Division 26.

F. Control components, all interlocks, (VAVs, actuators, smoke dampers, fire/smoke dampers, motor-operated dampers, fire alarm motors, etc.) and control wiring (277 volt, single phase and less) shall be provided under this Division 23 as required to achieve the specified control sequences. All electrical connections shall be specifically coordinated with Division 26 and any necessary scope included as part of Division 23.

G. All control wiring over 30 volts shall be installed by a licensed Electrician working under this Division 23.

1.07 SLEEVES, SEALS AND ESCUTCHEONS

A. Sleeves shall be provided through all pipe and ductwork penetrations of concrete or masonry walls, elevated floors and roofs, except those piping penetrations for equipment, etc.

B. Sleeves shall be fabricated from Schedule 40 steel pipe through 10" and Standard Wall steel pipe for sleeve sizes 12" and larger. All sleeves penetrating exterior walls, underground walls, pit or vault walls shall be provided with a 3" x 3/8" thick waterstop ring welded completely to the midpoint of the sleeve.

C. All sleeves penetrating exterior walls, underground walls, pit or vault walls and elevated floors shall be packed and sealed watertight.

D. Sleeves through roofs shall extend above the roof surface and be flashed watertight.

E. Sleeves through walls shall be cut and finished flush with each surface of the wall in which they are installed.

F. Sleeves through floors in mechanical rooms or other back of house spaces shall be installed with the top no less than 1/2" above the finished floor to allow for leak protection. Space between the top of the fire-stopping and top of the sleeve shall be packed with mineral wool and caulked to not allow water ponding within the sleeve.

G. Sleeves shall be sized to provide a minimum of 1/2" clearance between the inside surface of the sleeve and the outside finished surface of the pipe plus any insulation specified.

H. Fire-stops shall be provided as specified herein. All annular spaces between piping and sleeves, which do not require fire-stops, shall be packed with mineral wool and caulked.

I. Provide round, chrome-plated escutcheons on all exposed piping and ductwork penetrations passing through walls, floors, partitions and ceilings. Escutcheons shall be painted and caulked in coordination with Architect. Note that escutcheons should be only attached to the wall as piping and ductwork may move slightly during operation.

1.08 FIRESTOPS

A. Where piping, conduit, etc. pass through fire partitions, fire walls and floors, a firestop shall be provided that will ensure an effective barrier against the spread of fire, smoke and gases. Firestop material shall be packed tight and completely fill gaps between the ductwork, piping, conduit, etc. and the perimeter of their rough openings.

B. All penetrations shall be in accordance with UL 1479 or ASTM E 814 listed systems, and products used shall be specifically applicable for the appropriate installation conditions. Assemblies shall provide a minimum rating equal to the construction penetrated. Products shall be by HILTI, 3M, or ProSet.

C. Installation shall be by a Qualified Installer. Installer shall be certified, licensed, or otherwise qualified by the Firestopping Manufacturer as having the necessary training to install the Manufacturer's specific product. A Manufacturer or Vendor's willingness to sell the firestopping product to the Contractor or Installer does not in itself confer qualification.

D. Installer shall have at least one of the following qualifications:
1. FM 4991 Approved Contractor
2. UL Approved Contractor
3. HILTI, 3M, or ProSet Accredited Fire Stop Specialty Contractor

E. Installing Firm shall have no less than 3 years of experience with firestop installation.

F. A Manufacturer's direct Representative (not Distributor or Agent) shall be on site during initial installation of firestop systems to train appropriate Contractor personnel in proper selection and installation procedures.

G. The firestop Contractor or Installer shall supply As-Built documentation of each individual penetration location on the project. Documentation shall include a sequential location number, detailed description of the penetration location, size, and type, tested system number, type of assembly penetrated, and rating to be achieved. As-Built documentation shall be included with the close-out materials.

H. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach label permanently on both sides of penetrated construction in a visible location. The label shall include the following:
1. The words "Warning - Through Penetration Firestop System-Do Not Disturb"
2. Through Penetration firestop system designation and Manufacturer
3. Date of Installation

1.09 CORE DRILLING

A. Cutting of holes through concrete and masonry shall be by diamond core or concrete saw. Pneumatic hammer, impact electric and hand or manual hammer type drills will not be allowed, except as permitted by the Architect where required by limited working space. Locate holes such that they will not affect structural sections such as ribs or beams. Holes shall be laid out well in advance of the installation. These layout locations shall be approved by the Architect prior to drilling.

2.0 PRODUCTS

2.01 BID BASIS AND SUBSTITUTION PROCEDURES

A. Manufacturer names, series and model numbers, as noted or specified, are for the purpose of describing type, capacity, and quality of equipment, materials and products to be used. Unless "or equal" is specifically stated, bids shall be based only on the specified "basis of design" Manufacturer. The listing of a particular manufacturer as an "equal" or "acceptable substitute" manufacturer shall not be misconstrued as approving nor allowing the substitution of that Manufacturer's standard product in place of the basis of design. No consideration will be given to a product, which would require dimensional, spatial or aesthetic changes to the project. "Acceptable substitute" and "equal" manufacturers shall only bid those products, which exactly match the size and other characteristics of the specified basis of design. Any changes to other disciplines and trades of work required by an "or equal" or "substitute" product shall be duly considered and priced accordingly prior to bidding or pricing. The decision as to whether or not a proposed substitute or "equal" product is actually equal to that specified shall rest solely with the Architect.

B. Requests to provide "equal" products in lieu of those specified shall be submitted to the Architect in writing at least ten (10) days prior to final pricing and execution of the Contract. No consideration will be given to substitute products after final pricing and execution of the Contract.

C. Any "or equal" product or proposed product substitution which will cause a change in the appearance, dimensions or design of any part of the building, it structure, electrical system or any other engineered systems shall be accompanied by a scaled drawing and written description of the required change(s) for approval by the Architect. If deemed necessary by the Architect, Owner, or AHJ, design changes shall be signed and sealed by a registered Professional Engineer, currently licensed in this State. This shall be performed under the Contractor's scope who selects the substitution.

D. Any and all changes due to a substitution of basis of design equipment including but not limited to electrical connection, physical size, access, duct or piping connections, controls, etc. shall be solely the responsibility of substituting Contractor.

2.02 MINIMUM STANDARDS

A. Every piece of energy consuming equipment, all fire suppression products and life safety equipment shall comply with the following standards as applicable; especially in regard to prevailing codes:
1. Factory Mutual Laboratories (FM)
2. Industrial Risk Insurers (IRI)
3. Underwriters Laboratories, Inc. (UL)
4. ADC: Air Diffusion Council
5. AGA: American Gas Association
6. AMCA: Air Moving and Conditioning Association, Inc.
7. ANSI: American National Standards Institute
8. API: American Petroleum Institute
9. AHRI: Air Conditioning, Heating, and Refrigeration Institute
10. ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers
11. ASME: American Society of Mechanical Engineers
12. ASTM: American Society of Testing and Materials
13. AWWA: American Water Works Association
14. IBR: Institute of Boiler and Radiator Manufacturers
15. MSS: Manufacturers Standardization Society
16. NBBPVI: National Board of Boiler and Pressure Vessel Inspectors
17. NEMA: National Electrical Manufacturer's Association
18. OSHA: Occupational Safety & Health Administration
19. PDI: Plumbing Drainage Institute
20. PPI: Plastic Pipe Institute
21. SMACNA: Sheet Metal and Air Conditioning Contractors National Association, Inc.

3.0 EXECUTION

3.01 SUBMITTALS

A. Before preparing submittals, study all Contract Drawings and specifications in detail, obtain manufacturer's recommended instructions, and have submittals prepared based on specific equipment and material proposed for installation. An officer of the Contracting Firm shall sign all shop drawings (certifying conformance with plans and specifications) before submitting to the Architect or releasing to the field.

B. The submittal process shall not be utilized as an avenue to substitute products after the execution of the contract. Should an unspecified or unequal product be submitted, it will be rejected. If a second attempt at substitution is made during the resubmittal of the same product, then no more reviews of that product will be performed without direct compensation to the Engineer being paid for the additional services required for the third review and any further reviews.

C. All submittals shall be submitted and returned electronically.

D. Submittals will not be accepted for review unless they:
1. Comply with the requirements of Division 1
2. Include complete information pertaining to all appurtenances and accessories
3. Are submitted as complete packages which pertain to all related items in Division 23. Separate packages shall be submitted as follows:
   a. All HVAC equipment and components
   b. The automatic controls and EMS
4. Are properly marked with equipment, service, or function identification as related to the project and are marked with pertinent specification paragraph number

E. Submit catalog information, factory assembly drawings, field installation drawings and certifications as required for complete explanation and description of all items of equipment. The submittal data shall provide ample, unquestionable compliance with the Contract Documents.

F. Review of submittals shall not be construed as authorizing any deviations from the plans and specifications unless such deviations are clearly identified and separately submitted in the form of a letter that is enclosed with the submittals.

G. Submittals are required on all manufactured equipment, especially energy consuming equipment. Submittals shall include, but are not limited to, the following items of equipment:
1. Piping and Piping Specialties
2. Ductwork and Piping Insulation
3. Split Systems
4. Air Distribution Devices
5. Ductwork Accessories (Including All Dampers)
6. Fans
7. Louvers
8. T&B Company Certifications and Final Report
9. Ductwork and Piping Shop Drawings
10. Firestopping Products and Applicable UL Firestop Details

3.02 EXCAVATION, TRENCHING AND BACKFILLING

A. Perform all excavation, trenching and backfilling for underground work under this Division 23. During excavation, the excavated material shall be piled back from the banks of the trench to avoid overloading, slides or cave-ins. Do not exceed the angle of repose unless written approval is obtained in advance from the Architect for shoring, bracing or other alternate excavation methods. All excavated material not used for backfilling shall be removed from the building and disposed of as indicated or directed by the Architect. Take measures to prevent surface water from flowing into trenches and other excavations and any water accumulating therein shall be removed by pumping. All excavation shall be made by open cut. Tunneling shall not be allowed.

B. The bottom of all trenches shall be evenly graded to provide firm support and an even bearing surface. Pipe shall be laid on firm soil, laid in straight lines and on uniform grades. Provide bell holes so that the barrel of the pipe rests evenly on the bottom of the trench along the entire length of the pipe.

C. Pipe shall be inspected and tested prior to backfilling. Trench shall be handfilled to a minimum of 12" above the top of pipe with suitable earth (free of rocks, trash, large clods and organic material) and compacted to a minimum 95% proctor. After the first layer is completed, subsequent layers shall be filled and compacted the same as the first layer. Settling the backfill with water shall not be permitted.

3.03 INSTALLATION REQUIREMENTS

A. All equipment shall be installed in strict conformance with the recommendations of the Equipment Manufacturer, as indicated on the Drawings and as specified.

B. Provide installation manuals for each piece of equipment. Submit in separately bound volumes after review of submittals.

C. Provide supplementary steel framing and welded steel equipment support stands as required for proper hanging and support of the mechanical systems. Steel angles, channels and tubing utilized for such framing shall be selected for a maximum deflection of 1/360th of the span.

D. All roof curbs shall be a minimum of 12" high and selected for the various roof pitches. Curbs installed on roofs having pitches of not more than 1/4" per foot may be standard curbs shimmed level with steel channels or Zs to provide suitable support and flashing surfaces.

3.04 CLEANING, LUBRICATION AND ADJUSTMENT

A. The exterior surfaces of all mechanical equipment, piping, ductwork, conduit, etc., shall be cleaned and free of all dirt, grease, oil, paint splatter, and other construction debris.

B. Ducts, plenums, and air unit casings shall be cleaned of all debris and either vacuumed or blown free of all rubbish, dirt, and dust before installing grilles, registers or diffusers.

C. Bearings that require lubrication shall be lubricated in strict accordance with the manufacturer's recommendations.

D. All control equipment shall be adjusted to the settings required for the performance specified.

E. Fans shall be adjusted to the speed indicated by the Manufacturer to meet the installed final system pressure at the airflows indicated. Any additional sheaves and belts required for final adjustments shall be provided with no increase in the Contract amount.

F. Any fans operated during construction shall have temporary filters. Temporary filters shall be changed regularly to minimize contamination of the equipment and duct systems. Permanent filters shall be installed prior to final inspection.

G. All coils shall be thoroughly cleaned and combed prior to final inspection.

H. All materials, equipment, etc. subject to weather, corrosion, dust, debris, water etc. to be installed or utilized for the project shall be fully protected. This is inclusive of piping and duct openings and internal fan ventilation intakes and discharges. This Division's scope includes protection and remediation of any and all Division materials, etc. including cleaning, vacuuming, dusting, etc. required for a clean system and operation. Insulation and equipment with electrical connections subject to water shall be replaced in their entirety. Coordinate with all other trades and schedules.

3.05 PAINTING

A. All uncoated and uninsulated steel surfaces exposed to sight inside the building, such as piping, equipment hangers and supports which are not provided with factory prime coat or galvanizing, shall be cleaned and painted with one coat of rust inhibiting primer. In addition, all surfaces in finished spaces shall also be painted with two coats of finish paint in a colour selected by the Architect.

B. All ductwork surfaces, piping, supports, etc. visible through grilles, registers and diffusers in finished areas shall be painted flat black. All ductwork, equipment, piping, supports, air distribution, etc. visible in exposed finished areas shall be painted a colour selected by the Architect, except that nameplates shall not be painted.

C. Steel items exposed outside the building, such as equipment supports, uninsulated piping and hangers, which are not factory painted or galvanized, shall be cleaned and painted with one coat of rust inhibiting primer and two coats of asphaltic base aluminum paint. Insulated steel pipes outside the building shall be cleaned and painted with one coat of rust inhibiting primer before installing insulation.

D. Factory painted equipment that has been scratched or marred shall be repainted to match the original factory color.

3.06 DUCTWORK AND PIPING LEAK TESTING

A. Insulated, underground, and concealed ductwork and piping shall be tested for leaks in place before backfilling, concealing or covering. Tests shall be conducted in the presence of the Architect or their designated Representative.

B. All low pressure ductwork (design operating pressure of 1.0" WC ESP or less) shall be tested by the operation of the system to which it is connected.

C. All medium and high pressure ductwork (operating pressure of more than 1.0" WC ESP) shall be tested at 1.5 times the design operating pressure of the system to which it is connected, or at the total fan pressure at shut-off, whichever is greater, up to the maximum pressure classification of the associated ductwork system.

D. All visible and audible air leaks from the ductwork systems shall be repaired.

E. All refrigerant piping shall be 100% tested with the applicable ASHRAE standard - latest version.

F. All leaks shall be repaired by tightening, remaking joints, or replacing pipe and fittings. Caulking of joints shall not be permitted.

3.07 RECORD (AS-BUILT) DRAWINGS

A. At the completion of the project, provide a set of reproducible prints to the Architect which reflects all changes, deviations and revisions made to the original design documents. Locations of all underground piping and utilities shall be clearly shown and dimensioned from permanent reference points such as building column lines. Record drawings shall be produced in electronic format compatible with AUTOCAD. Furnish electronic copies of all drawings in dwg. format, and two (2) bond copies of all drawing sheets.

3.08 OPERATING AND MAINTENANCE MANUALS AND INSTRUCTIONS

A. Complete operating and maintenance manuals shall be provided to the Owner. Four copies shall be provided. Each copy shall be bound in a separate 3-ring, loose-leaf notebook. Operating instructions shall be provided for each mechanical system, and shall each include a brief system description, a simple schematic and a sequence of operation. Operating and maintenance instructions shall be provided for each piece of equipment. A control system wiring diagram shall be included in each operating and maintenance manual.

B. Prior to final acceptance or beneficial occupancy, provide the services of a Competent Technician for not less than one (1) day to instruct the Owner in

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BW&A Job No. 2024-1102

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ESTATE FORTUNA (TANGO CO.) FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE: 03.14.2025
DRAWN BY: A. COBB
CHECKED BY: C. LYLES
APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: M0.3

MECHANICAL SPECIFICATIONS

PROFESSIONAL ENGINEER
CHRISTOPHER LYLES
1781-E
U.S. VIRGIN ISLANDS

the operation of the mechanical systems.

3.09 TESTING AND BALANCING

A. Testing and balancing of the HVAC system shall be performed as specified in Section 23 05 93. Note that this work is to be performed under a separate Contract directly under the General Contractor. Submit four (4) copies of the test and balance report directly to the Architect.

3.10 WARRANTY

A. All work provided under this Division 23 shall be subject to a minimum one year warranty. The warranty shall include prompt repair or replacement of equipment or system failures and shall include all parts, refrigerant, and labor. In addition, all compressors shall carry an additional four year parts-only warranty. Extended warranties shall be provided on all other equipment so specified in other Sections.

3.11 SHOP DRAWINGS

A. Shop drawings per the submittal requirements shall be submit to the Design Team with adequate time for multiple rounds of review. Shop drawings shall show "As-Built" conditions including elevations, offsets, transitions, and accessories. Shop drawings shall indicate all code and manufacturer's recommended clearances, access, and coordinate the clearance and access requirements with all other trades.

B. Shop drawings that use keynotes direct from the Design Documents shall not be acceptable as they do not demonstrate coordination with all other trades, necessary transitions, etc.

C. Shop drawings shall be provided as complete packages in parallel with all trades to document coordination. Floor-by-floor or otherwise piecemeal shop drawings are generally not acceptable.

3.12 BID REQUIREMENTS

A. The Contractor shall include all systems, equipment and accessories shown on the plans and specifications.

B. The Contractor is responsible for providing all design documents to all SubContractors. All systems, equipment and accessories shall be included in the bid, whether shown on the SubContractor applicable plans or other design documents.

C. Should any discrepancy occur in the Design Documents, the Contractor shall provide a request for clarification prior to bid or note the discrepancy in the bid and provide an appropriate cost allowance in the bid.

D. The Contractor shall acknowledge that the Design Documents are diagrammatic and shall provide all systems, equipment and accessories required for a complete facility. Any areas that appear to be void of systems or inappropriate systems shall be noted in the bid. No post bid change order shall be considered for areas or discrepancies not noted in the bid.

E. All installation coordination and means and methods and labor and materials required for proper system installation shall be included.

F. These requirements are in addition to bid procedures and requirements of the RFP or general specifications.

END OF SECTION

SECTION 23 05 93
TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.0 GENERAL

1.10 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 05 93 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the testing and balancing (T&B) of the heating, ventilating and air conditioning (HVAC) systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Supply distribution systems
2. Return and exhaust air systems
3. Heating, ventilating and air conditioning equipment (all scheduled equipment as a minimum)
4. Domestic hot water recirculation system

1.11 INTENT

A. It is the intent of this Section of the specifications to provide a complete operable and balanced HVAC system as shown and specified which is reasonably airtight, comfortable and free of objectionable noise and vibration.

1.12 SCOPE OF WORK

A. HVAC test and balance shall be performed by an Independent Agency certified by the Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB) under direct contract to the General Contractor. All work performed by this Agency shall be performed by qualified Technicians under the direct supervision of an AABC or NEBB Certified Test and Balance Engineer. The Agency shall be independent and shall not be associated in any way with the installing HVAC SubContractor.

B. HVAC Test and Balance shall be performed in accordance with the 7th edition of the AABC National Standards, 2016 for Total System Balance or the NEBB Procedural Standards for TAB of Environmental Systems, 8th Edition, 2015 together with the NEBB TAB Manual for Technicians, 2nd Edition.

C. The final Test and Balance report shall serve to substantiate compliance with the intent of the Contract Documents, specifically the HVAC systems.

D. HVAC Test and Balance shall not begin until the systems are substantially complete.

E. Upon the completion of the Test and Balance work, the Agency shall submit four (4) copies of the complete HVAC Test and Balance Report directly to the Architect.

F. The Agency, as a part of its contract with the General Contractor, shall act as an Authorized Inspection Agency, responsible to the General Contractor and the Architect and shall, during the test and balance, list those items which require correction or have not been installed in accordance with the Contract Documents.

G. The Agency shall plainly mark the settings of all valves, dampers and other adjustable devices. If a balancing device is provided with a memory stop, it shall be set, locked and marked.

H. The Agency shall record all of the final set points on all variable speed drives.

1.13 SUBMITTALS

A. The name and certification of the Agency, along with the name and certification of the Certified Test and Balance Engineer, shall be submitted to the Architect for review within 30 days after the award of the General Contract.

B. The selected Agency shall submit to the Owner:
1. Procedural Manual
2. Report Forms
3. AABC or NEBB Performance Guaranty
4. Instrument List and Calibration Dates
5. Schedule
6. Floorplans as Needed to Uniquely Identify Device Locations

C. A reviewed copy of each of the above shall be returned to the Agency before the HVAC Test and Balance begins.

D. If a complete submittal in accordance with these requirements is not received within 60 days from award of the General Contract, then the Architect reserves the right to select the Agency.

2.0 PRODUCTS

2.03 (Not applicable).

3.0 EXECUTION

3.13 GENERAL CONTRACTOR'S DUTIES

A. The General Contractor shall provide the following, within 10 days after his receipt, to the Agency:
1. Contract Drawings
2. Contract applicable specification Division 23 (others as applicable)
3. Addenda
4. Change orders
5. Reviewed submittals

B. The General Contractor shall start-up and maintain the HVAC systems and shall continue the operation of the HVAC systems during each day of testing and balancing. Start-up and operation shall include, as a minimum, the following:
1. All equipment operable and in safe condition.
2. Temperature control system complete.
3. Proper thermal overload protection in place for electrical equipment.
4. Ductwork leakage rates not exceeding those specified and all duct systems clean of debris.
5. Air transfer systems shall have:
   a. Correct fan rotation and RPM.
   b. Coil fins cleaned and combed.
   c. Filters clean and in place.
   d. Access doors closed.
   e. All dampers in place and open.
   f. All grilles, registers and diffusers installed.

C. Provide sufficient time before final completion date so that testing and balancing can be accomplished. Coordinate the submitted T&B schedule.

D. Provide immediate labor and tools to make required corrections and repairs without undue delay.

E. The General Contractor and his SubContractors shall cooperate fully with the Agency to provide the following:
1. Access to HVAC system components.
2. The right to adjust the systems.

F. Any conditions which prevent a proper HVAC Test and Balance shall be reported by the Agency to the General Contractor and Architect within 7 days of their discovery.

G. If it is determined by the Agency and confirmed by the Architect that drive changes or additional balancing dampers are required, the Contractor shall obtain and install all necessary components.

H. The Agency shall cooperate with the Architect and the Contractor and all his SubContractors to perform the work in such a manner as to meet the job schedule.

I. The Agency shall verify that all system components are in place and in proper working order prior to leaving the project.

J. All reported and recorded data shall represent true measured conditions.

K. Where equipment uses variable speed drives, and where feasible, VFDs shall be used as the primary balancing method prior to adjustment or balancing of valves, dampers, etc.

END OF SECTION

SECTION 23 07 13
DUCT INSULATION

1.0 GENERAL

1.14 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 07 13 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the ductwork systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Insulation for typical ductwork
2. Duct liner
3. Insulation for generator exhaust pipe

1.15 INTENT

A. It is the intent of this Section of the specifications to provide a complete operable duct system as shown and specified which is reasonably airtight, free of noise, vibration and sweating, and fabricated so as to fit into the space allotted and to exhibit a minimum resistance to airflow.

2.0 PRODUCTS

2.04 DUCT LINER

A. Duct liner shall be one inch thick, 1 ½ lb. density (3 lb. density on medium- and high-pressure supply air systems except that 1 lb. density is acceptable if the liner is at least R ≥ 4.2 and NRC ≥ 0.65) fibrous glass with one face coated with a black fire retardant compound. The permanent composite fire and smoke hazard rating of the liner shall be stenciled on the liner face and shall be:
1. Maximum Flame Spread 25
2. Maximum Smoke Developed 50

2.05 TYPICAL DUCT INSULATION

A. Duct insulation shall be 3" thick, minimum 3/4 lb. density fiberglass, installed R ≥ 8.0, with an FSKL 0.00035" thick aluminum foil jacket, reinforced with fiberglass scrim. Thermal conductivity shall be a maximum of K = 0.29 at 75°F mean temperature, or a maximum of K=0.27 at 25% compression.

B. Insulation adhesive shall be Benjamin Foster 85-20. Tape shall be aluminum foil and shall be SMACNA listed and labeled.

C. The composite NFPA 90A and 90B, ASTM E84, UL rating of the installed insulation shall not exceed 25/50.

2.06 INSULATION FOR GENERATOR EXHAUST PIPE

A. Generator exhaust pipe including muffler or silencer, exclusive of corrugated ductwork at the generator exhaust connection, shall be insulated with two layers of Calcium Silicate insulation, with staggered joints. Each layer shall be bound by 302 stainless steel wire strap at 9" centers. The insulation shall be covered by 304 stainless steel cladding with a minimum of 2" overlap in the axial and horizontal directions. The cladding shall be secured by 0.5" wide, 0.015" thick 302 stainless steel bands at 9" centers. The insulation thickness shall be a required to limit the cladding surface temperature to 120°F or lower at the Generator Manufacturer's maximum flue discharge temperature. Insulation shall be manufactured by Manville, Owens-Corning, or PABC. Flexible piping connections shall be insulated as required to limit cladding surface temperature to 120°F or lower.

3.0 EXECUTION

3.14 INSTALLATION

A. Ductwork shall be installed in strict accordance with SMACNA, UL, and NFPA standards.

B. Duct liner shall be provided throughout all return air, transfer, and plenums. Duct liner shall also be provided for the following minimum distances, through the first elbow(s), or as otherwise indicated on the drawings, whichever is greater, downstream of each unit indicated below:
1. Split system air handling unit - 5 ft

C. Straight runs only shall be factored into the above distance requirements. Elbows, etc. within the length shall be lined but shall not count towards the length requirement.

D. Duct liner shall not be installed within six inches of a damper, including fire and/or smoke dampers. Metal nosings are required on the upstream side of the exposed insulation. Where lining has been interrupted, external insulation is required.

E. Duct liner shall be cut to provide overlapped and compressed longitudinal corner joints. Liner shall be installed with the coated surface facing the air stream. Duct liner shall be adhered to the ductwork with a 100% coverage of the sheet metal surfaces using a fire-retardant adhesive applied by spraying. Coat all exposed leading edges and all transverse joints with fire retardant adhesive. The liner shall be additionally secured using metal pins welded to the duct and speed washers. All leading edges shall be secured with sheet metal airfoils.

F. Inside the vapor barrier of the building all supply air ductwork which is not lined shall be insulated. All outside air ductwork shall be insulated. Exhaust duct shall be insulated from the exterior louver to the fan inlet. Insulation shall be cut slightly longer than circumference of duct to insure full thickness at corners. All insulation shall be applied with edges tightly banded. Insulation shall be adhered to duct with fire resistant adhesive. Adhesive shall be applied so that insulation conforms to duct surfaces uniformly and firmly. In addition to the adhesive, the insulation shall be additionally secured to the bottom of all ducts 18" or wider by means of welded pins and speed clips. The protruding end of the pins shall be cut off flush after the speed clips have been applied. The vapor barrier facing shall be thoroughly sealed with tape where the pins have pierced through. All joints shall be sealed with 2" wide SMACNA tape. Any cuts or tears shall be sealed with SMACNA tape.

G. All outside air ductwork located in conditioned or semi-conditioned spaces shall be externally insulated similar to supply ductwork.

H. All conditioned air ductwork, including outside air supply to the building and exhaust ductwork, installed in spaces that are ventilated only, i.e. penthouses, shall be insulated.

END OF SECTION

SECTION 23 23 00
REFRIGERANT PIPING SYSTEMS

1.0 GENERAL

1.16 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC 230500.

B. This Section 23 23 00 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the piping systems as specified herein and as shown for the heating, ventilating and air conditioning (HVAC) systems. These piping systems include, but are not limited to, the following:

1. Refrigerant suction and liquid piping (RS&RL)
2. Condensate drains (DR)
3. Refrigerant suction and liquid piping insulation

C. All insulation products installed indoors shall meet ASTM E 84, UL 723, NFPA 90A, and 90B requirements for Flame Spread Rating 25 and Smoke Developed Rating 50.

D. Insulation products in air plenum spaces shall be listed and labeled and have a fire hazard rating not more than 25 for flame developed and not more than 50 for smoke developed.

1.17 INTENT

A. It is the intent of this Section of the specifications to provide complete and operable piping systems as shown and specified which are free of leaks, properly vented, free of noise, vibration, and sweating, and fabricated so as to fit the space allotted and to exhibit a minimum resistance to fluid flow. It is also the intent of this Section of the specifications to provide a complete piping insulation system which is free of gaps and tears, properly fitted and finished, free of sweating, and fabricated so as to fit the space allotted and to exhibit a negligible heat transfer.

B. The word "piping" is defined to mean all piping, fittings, joints, hangers, coatings, valves, test and sensor wells and accessories necessary for the refrigerant piping systems described, shown, and specified.

1.18 GENERAL REQUIREMENTS

A. Provide all reducing fittings, flanges, couplings and unions of the size and type of material to match the piping to each piece of equipment, valve, and accessory.

B. Union joints, couplings or flanges shall be provided in each pipeline connected to each piece of equipment and elsewhere as indicated and specified. Unions shall match the piping system in which they are installed.

1. Unions or flanges shall be provided between all copper to steel connections in water-carrying piping. These unions shall be dielectric, insulating type.

C. All changes in direction and branches shall be made with manufactured fittings.

D. All pipe joints shall be cut square and all burrs shall be removed.

E. Fabrication of a bull-head tee connection is strictly prohibited.

F. Open ends of pipelines not currently being handled shall be plugged during installation to keep dirt, water, and foreign material out of the system.

G. Horizontal refrigerant and drain piping shall slope down in the direction of flow at a minimum slope of 1/8" per foot of run.

H. All insulation products installed indoors shall meet NFPA 90A, 90B and 255 requirements for Flame Spread Rating 25 and Smoke Developed Rating 50.

1.19 FIRE-STOPS

A. Where pipes pass through fire partitions, fire walls and floors, install a fire-stop that shall provide an effective barrier against the spread of fire, smoke and gases. Fire-stop material shall be packed tight and completely fill clearances between pipes and openings. Fire-stop material shall conform to the following:
1. Fire-stopping material shall maintain its dimensions and integrity while preventing the passage of flame, smoke, and gases under conditions of installation and use when exposed to the ASTM E119 time-temperature curve for a time period equivalent to the rating of the assembly penetrated. Fire-stopping material shall be noncombustible as defined by ASTM E136; and in addition, for insulation materials melt point shall be a minimum of 1700°F for 1-hour protection and 1850°F for 2-hour protection. Fire-stopping material shall be Dow-Corning RTV Foam or an approved equal.

1.20 ACCEPTABLE MANUFACTURERS

A. Insulation products shall be as manufactured by Owens Corning, Knauf, Manville, Certainteed, Dow, or Armacell.

2.0 PRODUCTS

2.07 PIPE AND FITTINGS

A. All pipe and fittings shall be products of a domestic manufacturer.

B. Pipe and fittings shall be as listed and outlined below:

SERVICE	MATERIAL TYPE	SIZES
1. Refrigerant Suction and Liquid	1	All
2. Drains*	2	All

*Note: As an option, on cooling coil condensate drains (which are not installed in a plenum) the drain piping may be schedule 40 PVC with solvent joints; subject to advance approval by the Local Authorities. Fittings shall meet ASTM D2466 and solvent shall meet ASTM D2564.

C. The pipe, fittings and joints shall be as outlined below:
1. Material Type 1:
   a. Pipe - Type L hard drawn copper tubing meeting ASTM B88 or ASTM B280.
   b. Fittings - Wrought copper meeting ANSI B16.22.
   c. Joints - Silver brazed with sil-fos or silver solder.
2. Material Type 2:
   a. Pipe - Copper drainage tube DWV meeting ASTM B306.
   b. Fittings - Wrought copper solder-joint drainage fittings meeting ANSI B16.29.
   c. Joints - Soldered with a solder meeting ASTM B32.

2.08 PIPE HANGERS AND SUPPORTS

A. Pipe hangers, trapeze hangers, upper attachments, rods, and other supports shall be selected based on pipe size and material contained therein. Provide all hangers, rods, turnbuckles, angles, channels, and other supports to securely support the piping systems from the building structure.

B. All materials utilized for the hanging and support of the piping systems shall be manufactured products which are specifically intended for the purpose of hanging piping systems. The use of wire, steel straps, plastic ties, etc. is strictly prohibited.

C. Supports and hangers shall be selected to fit around the pipe (and insulation unless otherwise specified herein) and provide adequate movement for expansion of the piping systems. Anchors shall be provided to restrict and control such movement within offsets and expansion loops.

D. All hangers and supports shall be selected at a minimum factor of safety of five based on the ultimate tensile strength of the material.

E. Intermediate pipe supports shall be provided between building structural members so as not to exceed maximum support spacing specified and shall be structural steel angles (minimum 2 1/2" x 2 1/2" x 1/4"). In steel construction, intermediate supports shall be securely clamped to steel beams and to steel joists, and in no case shall supports be attached to roof decks.

F. For suspending pipes from concrete beams, upper attachments shall be side beam bracket utilizing bolts in sleeves set in top portions of the beams. Where sleeves are not used, provide expansion shields or power-actuated fasteners.

G. Hanger rods for pipe hangers shall be as follows:

HANGER ROD SIZE	NOMINAL PIPE SIZE
3/8"	2" and smaller
1/2"	2 1/2" and larger

H. Pipe hangers or supports shall be provided within 18" of each horizontal fitting, equipment connection, valve, etc. and within 18" of the centerline of horizontal or vertical changes in direction summing to 90° or more. Specific attention is called to vertical turns into risers.

I. Pipe hangers or supports shall be provided within 18" of each horizontal fitting, equipment connection, valve, etc. and within 18" of the centerline of horizontal or vertical changes in direction summing to 90° or more. Specific attention is called to vertical turns into risers.

J. Piping supports shall be provided, at a minimum, in accordance with the greater of the below or at code minimum. Where the below or code does not address support for specific piping, supports shall be in accordance with manufacturer's requirements.

Piping Material	Max. Horz. Spacing	Max. Vert. Spacing
Cast-iron pipe	5'	15'
Copper pipe	12'	10'
Copper tubing ≤ 1-1/4" dia.	6'	10'
Copper tubing ≥ 1-1/2" dia.	10'	10'
PVC pipe	4'	10"*

*Midstory guide required for piping 2" diameter and smaller

K. Provide pipe saddles and shields on all insulated piping as outlined below:
1. All insulated piping shall be supported on galvanized shields.
   a. Shields shall be as follows:
      (i) Pipes 2" and smaller: 18-gauge x 12" long.
      (ii) Pipes 2 1/2" and larger: 16-gauge x 18" long.
   1) Shields shall be 180 degrees around the lower half of the pipe at all pipe hangers, except that on trapeze hangers, pipe racks and floor supported horizontal pipes, shields shall be 360 degrees around the entire pipe.

L. Provide riser clamps at all floor penetrations.

2.09 VALVES

A. All valves shall have the manufacturer's name or trademark and the working pressure cast or stamped on the valve body.

B. All valves shall be designed and constructed for refrigerant service.

2.10 PIPING INSULATION

A. Flexible elastomeric foam closed-cell insulation shall be provided over all

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ESTATE FORTUNA (TANGO CO.) FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE: 03.14.2025
DRAWN BY: A. COBB
CHECKED BY: C. LYES
APPROVED BY: C. LYES

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: M0.4

MECHANICAL SPECIFICATIONS

PROFESSIONAL ENGINEER
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U.S. VIRGIN ISLANDS

refrigerant suction piping, cooling coil condensate, and other services as specified or noted. Refrigerant suction piping insulation shall be 1-1/2" thick 25/50 AP Armaflex, black. Insulation shall be wrapped by listed and labeled product in return air plenums. Cooling coil condensate insulation shall be 1" thick ArmaFlex Ultra. All glues and coatings shall be products of the same Manufacturer as the insulation. Insulation shall comply with ASTM C534, Type I for tubular materials. Insulation shall be listed and labeled per UL 723 at 25/50 when used in return air plenums.

B. Insulation shall be continuous over all valve bodies, fittings, and wall and floor penetrations.

3.0 EXECUTION

3.15 ARRANGEMENT

A. Piping shall follow the general layout, arrangement, schematics, and details. Provide all offsets, vents, drains, charging ports and connections necessary to accomplish the installation. Fabricate piping accurately to measurements established at the project site to avoid interference with ductwork, other piping, equipment, openings, electrical conduits and light fixtures. Make suitable provision for expansion and contraction with expansion loops and offsets.

3.16 REFRIGERANT PIPING INSTALLATION

A. All refrigerant piping shall be sized in accordance with the air conditioning equipment manufacturer's written instructions. Provide charging ports, solenoid valves, service valves, dryers, etc. at each piece of equipment.

B. All brazing shall be done while the line is being flushed with carbon dioxide, nitrogen, or other inert gases.

C. The inside of all tubing shall be thoroughly cleaned and internally wiped with a lintless, dry cloth.

D. Suction lines shall drop below their coils before any horizontal run.

E. Provide oil traps at least every ten feet for extended vertical risers.

F. All oil traps shall be constructed from close-radius type fittings.

G. Dryer cores shall be installed to remove horizontally or downward.

H. Install external equalizer downstream of its expansion valve sensing bulb.

I. Install expansion sensing valve bulb on top centerline of piping up to 5/8" size; install 45 degrees down from the horizontal centerline on pipe sizes 7/8" and larger.

3.17 CLOSED-CELL PIPING INSULATION INSTALLATION

A. Insulation shall be provided on all refrigerant suction and indoor cooling coil condensate drain lines. The insulation shall be installed by the slip-on method; slitting of the insulation is prohibited and shall be cause for rejection, except that AP ArmaFlex Lapseal with interior adhesive liner and wide adhesive lap seal is acceptable. All elbows shall be mitered, and all such joints and butt joints shall be tightly made and glued.

B. All insulation installed outdoors shall be coated with a glossy white, ultraviolet protective coating applied in two coats.

END OF SECTION

SECTION 23 31 00
HVAC DUCTS, ACCESSORIES, AND CASINGS

1.0 GENERAL

1.21 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 31 00 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the ductwork systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Supply air ductwork
2. Return, transfer and relief air ductwork
3. Exhaust ductwork
4. Generator flue exhaust
5. Outside air ductwork
6. Ductwork accessories

1.22 INTENT

A. It is the intent of this Section of the specifications to provide a complete operable duct system as shown and specified which is reasonably airtight, free of noise, vibration and sweating, and fabricated so as to fit into the space allotted and to exhibit a minimum resistance to airflow.

B. Generator flue exhaust, including any muffler, enclosure, etc. shall be provided as a complete package by Division 26. Coordinate with Division 26. If Division 26 excludes this scope, the generator flue exhaust system shall be a Delegated Design under this Division 23. Design shall include system from the termination of Division 26 scope to outside the building, including any required thermal expansion bellows, fittings, supports, etc. See specification 230713 for insulation requirements.

1.23 DESIGN AND CONSTRUCTION - DUCTWORK

A. Ductwork shall be provided in strict accordance with the third edition - 2005 - of the SMACNA HVAC Duct Construction Standards - Metal and Flexible, NFPA No. 90A, 90B, 91 and 96, and UL 181. **Where SMACNA tables have an option between different gauges and supports, the heavier gauge shall be used.**

B. Ductwork dimensions shown are net, clear, inside dimensions with no allowance shown for duct liner. All ductwork specified to be lined shall be 2" larger than shown in each dimension to compensate for the liner. Ductwork shall be square, rectangular, round, spiral or flat oval as noted. Conversion of duct shapes and sizes shown shall be accomplished without increasing air velocities or friction losses and is subject to prior approval by the Architect and Engineer.

C. Elbows shall be either full radius type (inside radius equal to duct width), five-gore radiused flat-oval type or, in low pressure systems only, mitered with double-thickness turning vanes except that lined ductwork for low pressure returns and transfers shall not have turning vanes.

D. Abrupt changes in duct sizes and shapes shall not be permitted. The total angle of diverging transitions shall be not more than 15 degrees; converging transitions shall be not more than 30 degrees unless otherwise noted or required due to structural constraints.

E. Offsets, transitions, rises and drops are not individually called out on the Design Drawings. They shall be provided as required to fit the ductwork into the allocated spaces.

F. Transition rectangular ductwork on bottom and sides. Maintain top of ductwork level and as high as possible.

G. All ductwork shall be constructed for standard 1" WC static pressure class at 2500 FPM with Class C seals and is herein defined as "low pressure ductwork".

H. Provide the following types of ductwork material for the services indicated:

1. Galvanized sheetmetal: supply, return, exhaust, and relief of conditioned and outside air
2. Black steel: generator pipe

2.0 PRODUCTS

2.11 GALVANIZED SHEETMETAL

A. Galvanized sheetmetal shall be lock-forming grade G90-ASTM A 653 hot dip galvanized steel sheets. Sheetmetal shall be galvanized on each side with not less than 1.25 ounces of zinc per square foot.

B. Galvanized sheetmetal installed outside the building and subject to weather shall be soldered or welded. See Section 23 07 13 for additional information about covering and insulation.

C. Galvanized sheetmetal installed outside the building and not exposed to weather, such as in covered loading docks and parking decks, may match the construction of ductwork inside the building.

D. Galvanized sheetmetal ductwork outside the building within 20 miles of the seacoast shall have corrosion coating appropriate to the installation location.

2.12 SPIRAL DUCT

A. Spiral duct shall be utilized for all flat-oval and round ductwork in medium and high-pressure systems.

B. Spiral duct shall be the product of United McGill Corporation, R.V. Money, Eastern Sheet Metal, or an approved equal.

C. Spiral duct with internal ribs is not acceptable.

D. Spiral duct shall conform to SMACNA 2005 Standards. Lighter gauges, etc. due to standing ribs are not acceptable.

E. Spiral duct in exposed ceiling applications shall have slip fittings, minimum Class 3 for 2" WG negative pressure to 10" WG positive pressure, with EPDM gaskets. Coordinate assembly with ductwork insulation.

2.13 BLACK STEEL

A. Black steel utilized for grease exhaust ductwork shall be minimum 0.054" thick (16 gauge MSG) black carbon steel.

B. Grease exhaust ductwork shall be constructed with smooth elbows and transitions. There shall be no obstructions that could collect grease, including but not limited to: flanges, ductwork overlaps, transitions, turning vanes, access hatch lips, etc.

C. Black steel ductwork for generator flue exhaust shall be similar except that it shall be sloped away from the generator and to a ductwork drain location.

2.14 DAMPERS

A. Manual Volume Dampers

1. Single blade butterfly dampers are acceptable up to 12" round or 12" x 12" square. Dampers larger than these dimensions shall be multi-blade type. Single blade dampers shall be constructed of 16 gauge or heavier galvanized sheetmetal.

2. No multi-blade damper blade shall exceed 8" in width. All multiple blade dampers shall be constructed of 16 gauge galvanized steel or heavier. The damper frame shall be 16 gauge or heavier. The damper action shall be opposed-blade type.

3. Each blade shall pivot on a 1/2" cadmium plated, cold-rolled steel axle which pivots within self-lubricating, Oilite bronze bearings.

4. The top and bottom edges of each rectangular damper blade shall be crimped for stiffness.

5. The operating rod for all dampers shall be extended outside the damper frame for attachment of an operator. Each operator shall have a position indicator and locking quadrant.

6. All dampers utilized for introduction of outside air shall have flexible, gasketed edge and end seals. The leakage rate shall be less than 4 CFM per SF of face area against a 1" WC differential pressure, based on a nominal 48" x 48" damper size.

7. All dampers utilized for exhaust or relief air shall have flexible, gasketed edge and end seals. The leakage rate shall be less than 4 CFM per SF of face area against a 1" WC differential pressure, based on a nominal 48" x 48" damper size.

8. Dampers to be installed in insulated ductwork shall have standoffs sufficient to allow for insulation and vapor barrier integrity.

9. Manual volume dampers shall be as manufactured by Louvers & Dampers, Inc., Pottorff, Greenheck, Nailor, Ruskin, or an approved equal.

B. Control Dampers

1. Control dampers shall be of the same construction as manual volume dampers, except that no manual operator and quadrant is required. The operating rod shall be suitable for operation by an automatic pneumatic or electric operator.

C. Fire Dampers

1. Fire dampers shall be UL-listed and labeled for 1 1/2 or 3 hours, in accordance with the installation location, and shall be provided with 160°F links or linkages appropriate for the service. Dampers installed within ducts shall be Type B or Type C with the blades out of the air stream. Areas indicated shall be net, clear, open areas.

2. Fire dampers shall be appropriate for the installation location and application. All fire dampers in supply, return, exhaust, etc. shall be dynamic-type.

3. Fire dampers shall be as manufactured by Louvers & Dampers, Inc., Pottorff, Greenheck, Nailor, Ruskin, or an approved equal.

D. Smoke Dampers

1. Smoke dampers shall be UL-listed as Class 1 low-leakage smoke dampers. Smoke dampers shall be 24V and wired under this Division.

2. Smoke dampers shall be appropriate for the installation location and application. All fire dampers in supply, return, exhaust, etc. shall be dynamic-type.

3. Smoke dampers shall be as manufactured by Prefco, Louvers & Dampers, Inc., Pottorff, Greenheck, Nailor, Ruskin, or an approved equal.

E. Fire/Smoke Dampers

1. Fire/smoke dampers may be combined into a combination fire/smoke dampers. All provisions of the above shall apply. Fire/smoke dampers shall be UL-listed.

F. Backdraft Dampers

1. Backdraft dampers shall be sized according to their installation location and noted pressure setting. Damper pressure setting shall be adjustable and shall be accessible from outside ductwork or via access hatch, as applicable.

2.15 LOW-PRESSURE DUCT BRANCHES

A. Splitter dampers shall be provided at all low-pressure ductwork branches. All low-pressure ductwork branches shall be radiused or 45 degree take-offs; straight taps are unacceptable. The length of the damper blade shall be the same as the width of the widest duct section at the split, but in no case shall blade length be less than 12". Each operator rod shall have a locking swivel joint.

2.16 FLEXIBLE DUCT

A. Flexible ductwork shall be Class 1, UL 181 air duct and meet NFPA 90A and 90B Standards.

B. The internal duct surface shall be acoustically rated, core layers bonded to a coated steel wire helix. The external jacket shall be a fiberglass, bi-directionally reinforced, metallized vapor barrier with a standing, triple ply seam. Fiberglass insulation shall be provided between the duct surface and the jacket to achieve a minimum R-8. Any flex duct outside the building thermal envelope shall be R-8 in Climate Zones 1-4 and R-12 in Climate Zones 5-8.

C. Flexible ductwork shall be suitable for 10" WG positive pressure and 0.5" WG negative pressure in sizes 4" through 12" ID, and 6" WG positive pressure and 0.5" WG negative pressure in sizes 14-16" ID.

D. Flexible ductwork, insulation and insulation cover shall be suitable for ceiling return air plenum installation and shall comply with all applicable codes and standards regarding such ceiling plenum installations.

E. Flexible duct shall be ATCO, Thermaflex or an approved equal.

F. The maximum allowable installed length of flexible ductwork shall be as follows:

1. 8'-0" on low-pressure supply air systems limited to short runouts and end of runs connected to round neck supply diffusers and registers.

2. 4'-0" on medium and high-pressure supply air systems limited to the runouts from the sheetmetal ductwork to each terminal unit.

3. 2'-0" on connections from round neck grilles to sheetmetal ductwork on return, exhaust and transfer ductwork.

G. Provide a spin-in fitting with integral scoop and volume damper at all flexible run-out connections in low-pressure supply air ductwork only, except locations where spin-in fittings would project more than 50% into the projecting ductwork dimension. **Adhesive fittings are acceptable provided they are also screwed to the ductwork and sealed with mastic.

H. Flexible ductwork shall not pass through wall, floors, or ceilings.

2.17 FLEXIBLE CONNECTIONS

A. Provide flexible duct connections at the inlet and outlet of each belt-driven fan, indoor unit, fan coil unit, air handling unit, etc., and at all other locations indicated. Flexible connections shall be fabricated from a glass fabric coated on both sides with neoprene. Minimum weight shall be 30 oz. per sq. yard. Flexible connections shall be used for vibration isolation only and shall not be used to correct connection misalignment.

2.18 DUCT HARDWARE

A. Duct hardware shall be as manufactured by Young Regulator or an approved equal.

2.19 ACCESS DOORS

A. A duct access door shall be provided at each fire and smoke damper. Access doors shall be designed for 1.5 times the pressure of the duct in which they are mounted. Access doors shall be of sufficient size to provide access to the dampers for resetting the blades and replacing the links. Access doors in medium and high-pressure ductwork shall be installed downstream of fire dampers and shall be implosion type. Where access is provided through gypsum board walls or ceilings, furnish access door for installation under Division 09. Coordinate with Division 09 and Architect. Each door shall match the fire-rating of the wall or ceiling indicated.

B. Access shall be provided to duct-mounted smoke detector locations. Access shall allow inspection and maintenance of all aspects of the detector. Access doors shall meet the requirements of A, above, as needed.

3.0 EXECUTION

3.18 INSTALLATION

A. Ductwork shall be installed in strict accordance with SMACNA, UL, and NFPA standards.

B. All ductwork installed outside the building shall be secured to the structure. Coordinate with the Structural Engineer as needed. It is the Contractor's responsibility to design and coordinate all supports. All supports shall be designed to withstand all code-required wind and seismic loads.

C. Flexible ducts utilized in the low-pressure ductwork systems shall be installed without kinks or bends which are less than a centerline radius equal to or greater than twice the diameter of the flexible duct being installed.

D. Ductwork labels, including factory labels, tags, etc. except equipment nameplates shall be removed to the satisfaction of the Architect in all exposed areas.

E. Dampers shall be adjustable. Where dampers are not or will not be accessible without access panels, provide and install remote balancing cable control system, Young Regulator or equal. Adjustment shall be from a nearby accessible area.

END OF SECTION

SECTION 23 34 00
HVAC FANS

1.0 GENERAL

1.24 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 34 00 and the accompanying drawings cover the provision of all labor, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the fans as specified herein and as shown. These fans include, but are not limited to the following:
1. Inline fans
2. Ceiling/cabinet fans

1.25 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted fans as shown and specified which are free of excessive noise, vibration and airflow fluctuations.

1.26 BASIS OF DESIGN

A. The basis of design is as scheduled. Any proposed substitutions shall be proven equal in all aspects to the equipment specified as the basis of design. Particular attention is called to the requirements of Section 23 05 00.

1.27 ACCEPTABLE SUBSTITUTE MANUFACTURERS

A. Acceptable substitute manufacturers are Carnes, Cook, Acme, PennBarry, Twin City, Price, and Greenheck. Acceptable manufacturers for kitchen grease exhaust fans are Captive-Aire, Viking, and Greenheck.

2.0 PRODUCTS

2.20 GENERAL REQUIREMENTS

A. All non-filtered fans shall be factory tested, rated and certified in accordance with the requirements of AMCA Standard No. 210 and shall be labeled accordingly. Filtered fans may be non-labeled but must be rated in an AMCA approved laboratory in accordance with 210.

B. All exhaust fans shall be provided complete with gravity-type backdraft dampers.

C. All belt-drive assemblies shall be mounted on vibration isolators.

D. All motors on belt-drive assemblies shall be mounted on slide bases to provide adjustment of belt tension.

E. All belts in belt drives shall be rated for not less than 150% of the connected motor horsepower.

F. All belt-drives driven by a 5 HP or larger motor shall be multiple belt arrangements.

G. All belt-drives shall be adjustable to a minimum speed variation of plus or minus 20% of the design RPM.

H. All centrifugal fan wheels shall be statically and dynamically balanced.

I. All electric motors and equipment shall be UL labeled.

J. Refer to Division 26 of these specifications and to the electrical Contract Drawings for electrical characteristics and connections to all equipment. Coordinate all electric motors and other equipment with these electrical documents.

K. All exposed motors and belts shall be protected with enclosures or guards in accordance with OSHA requirements.

2.21 CEILING/CABINET EXHAUST FANS

A. Ceiling/cabinet exhaust fans shall be Greenheck Model CSP (inline/cabinet) or Greenheck Model SP (ceiling) with integral grille, or an approved equal. Wherever possible, fans are to be provided with EC motors.

3.0 EXECUTION

3.19 INSTALLATION

A. Fans shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual units to be provided with all trades.

3.20 ADJUSTMENT

A. The fans shall be tested and adjusted after installation to provide the capacities indicated.

END OF SECTION

SECTION 23 37 13
DIFFUSERS, REGISTERS, AND GRILLES

1.0 GENERAL

1.28 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 37 13 and the accompanying drawings cover the provisions of all labor, equipment, appliances and materials, and performing all operations in connection with the construction and installation of air distribution devices as specified herein and as shown. These units include, but are not limited to the following:
1. Ceiling Diffusers (CD)
2. Return Air Grilles (RAG)
3. Exhaust Diffusers (ED)
4. Supply Registers (SR)
5. Exhaust Registers (ER)
6. Return Grille (RG)
7. Linear Slot Diffusers (LSD)
8. Linear Exhaust Slots (LES)
9. Linear Return Slots (LRS)

1.29 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted air distribution devices as shown and specified which are free of excessive noise, vibration and airflow fluctuations.

1.30 SELECTION CRITERIA

A. All air distribution devices shall be selected in accordance with the following minimum criteria unless otherwise noted below or on the drawings:

1. Method of mounting shall be compatible with the ceiling, wall or duct surface which it mounts on or in; i.e. lay-in, surface mounting, plaster frame, duct collar, etc. The architectural drawings shall be referenced to determine the mounting method for each device. All flanges on surface mounted devices shall be provided with a gasket.

2. Finish of all ceiling mounted devices shall be selected to match the color of the adjacent ceiling. Finish of all wall mounted devices shall be primer which is compatible with the finish coating specified for the adjacent wall; finish coat will be applied under Division 9.

1.31 BASIS OF DESIGN

A. The basis of design is Titus. Any proposed substitutions shall be proven equal in all respects to the equipment specified as the basis of design. Any modifications to ductwork, controls, ceilings, building structure, etc., that result from any substitution shall be coordinated with all trades. This coordination shall occur before delivery of equipment and any modifications shall be performed without incurring additions to the Contract.

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

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WEST END
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ISLANDS

DATE: 03.14.2025
DRAWN BY: A. COBB
CHECKED BY: C. LYLES
APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: M0.5

MECHANICAL SPECIFICATIONS

PROFESSIONAL ENGINEER
CHRISTOPHER LYLES
1781-E
U.S. VIRGIN ISLANDS

1.32 ACCEPTABLE MANUFACTURERS

A. Acceptable manufacturers are Price, Carnes, Metal Aire, Krueger, Nailor, and Titus UON, provided that their units, performance, appearance and physical characteristics are equal in all respects for this specific project.

2.0 PRODUCTS

2.22 DESCRIPTION

A. Ceiling Diffusers (CD)

1. Ceiling diffusers shall be aluminum face with steel back pan, perforated face diffusers equipped with fully adjustable pattern controls, capable of providing one-way, two-way, two-way corner, three-way, and four-way air patterns; Titus PAS-AA. Diffuser performance data shall be in accordance with ADC equipment test code 162R4. The perforated face shall be hinged for easy access to pattern controls and duct accessories. The maximum NC level at design airflow shall not exceed 35 when measured in a direct field 5'-0" from the face of the device. Size shall be 24"x24" unless indicated otherwise on the drawings.

B. Return Air Grilles (RAG)

1. Return air grilles shall be hollow core, aluminum, perforated face, lay-in type, selected to match the CDs; Titus PAR-AA. Performance data shall be in accordance with ADC 162R4. All other characteristics shall be equal to the ceiling diffusers.

C. Exhaust Diffusers (ED)

1. Exhaust Diffusers shall be hollow core, aluminum, perforated face, lay-in type, selected to match the CDs; Titus PAR-AA. Performance data shall be in accordance with ADC 162R4. All other characteristics shall be equal to the ceiling diffusers.

D. Supply Registers (SR)

1. Supply registers shall be surface mounted, aluminum registers, adjustable double-deflection type complete with opposed blade dampers for balancing purposes. Blade spacing shall be 3/4 inch. The outermost set of deflection blades shall be parallel to the long dimension of the SR and the innermost set of deflection blades shall be parallel to the short dimension of the SR. The registers shall be tested in accordance with ADC standards and shall be selected to provide design airflow at a maximum NC of 35. SRs shall be Titus 272FL.

E. Exhaust Registers (ER)

1. Exhaust registers shall be surface mounted, aluminum registers with a single set of fixed curved blades parallel to the long dimension. Include an opposed blade damper. Blades shall be at 45 degree fixed deflection and ¾ inch spacing. Damper blades shall be gang operated by means of a key which can be removed after balancing. ERs shall be Titus 3FL, sized as indicated.

F. Return Grilles (RG)

2. Return grilles shall be surface mounted, aluminum registers with a single set of fixed curved blades parallel to the long dimension. Blades shall be at 45 degree fixed deflection and ¾ inch spacing. ERs shall be Titus 3FL, sized as indicated.

G. Linear Slot Diffusers (LSD)

1. Linear slot diffusers shall be Titus ML-39. Diffusers shall be of aluminum construction with one or more parallel slot(s). Diffusers shall have two (2) slots unless otherwise indicated. Each slot shall contain pattern controls, adjustable from the face of the diffuser. Each LSD shall be continuous length as indicated on the drawings, complete with finished ends, mitered corners and splined joints. All inactive sections of the LSD considered as LRS devices. Plenums shall have round collars for connection of flexible duct. Each LSD shall be provided with a lined steel plenum with tappings for round duct connections as indicated. Maximum NC level per ADC shall not exceed 35 at design airflow. Liner shall conform to NFPA 90A 25/50 requirements. Border option to be selected by Architect and shall be appropriate for the installation location.

H. Linear Exhaust Slots (LES)

1. Linear exhaust slots shall equal specified LSD except they shall be provided without pattern controls and shall be provided with insulated light shields.

H. Linear Return Slots (LRS)

1. Linear return slots shall equal specified LSD except they shall be provided without pattern controls and shall be provided with insulated light shields.

3.0 EXECUTION

3.21 INSTALLATION

A. Air distribution devices shall be installed as indicated and in conformance with the manufacturer's recommendations. The color, frame, and border types shall be coordinated with Architectural requirements and shall be selected to install in the finished surface indicated.

B. All air distributions devices to be reused shall be installed the same way as indicated for new devices. All existing color, frame, and border types shall modified as required to match new device requirements.

C. All air distribution devices with blade orientations shall be coordinated with Architect. Specific attention is called to devices in exposed ceiling areas, including wall-mounted.

3.22 ADJUSTMENT

A. Grilles, registers, diffusers, etc. shall be tested and adjusted to provide the scheduled air flow capacities.

B. All devices shall have adjustable and accessible volume dampers. Where dampers are not or will not be accessible without access panels, provide and install remote balancing cable control system, Young Regulator or equal. Adjustment shall be from the face of the air distribution device, coordinated with the Air Distribution Manufacturer. Coordinate the location and size of the damper with the installation.

END OF SECTION

SECTION 23 37 23
HVAC LOUVERS

1.0 GENERAL

1.33 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 37 23 and the accompanying drawings cover the provisions of all labor, equipment, appliances and materials, and performing all operations in connection with the fabrication, construction and installation of the louvers, air inlet and air outlet devices as specified herein and as shown.

C. Coordinate with Architectural plans and specifications for all louvers subject to public view. Architectural documents shall supersede this specification section, except Architectural louvers must meet the free area noted in the Division 23 plans, and louvers exposed to rain must be stormproof.

1.34 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, finished louvers, air inlet and air outlet devices as shown and specified which are free of leaks.

1.35 BASIS OF DESIGN

A. The basis of design is as outlined for each louver and device in the 2.0 PRODUCTS subsection. Any proposed substitutions shall be proven equal in all respects to the equipment specified as the basis of design.

2.0 PRODUCTS

2.23 HURRICANE LOUVERS

A. Louvers shall be AMCA 540/550 extreme performance water, air and wind driven rain Miami-Dade listed louvers. Frame shall be a double frame, two-piece blade design with horizontal front and vertical rear blades. Depth to match the width of the wall but no less than 4" deep, and of all-welded construction fabricated from 6063T6 extruded aluminum alloy. Blades shall be slanted at 45 degrees and feature an integral water baffle.

B. Louvers shall be fitted with an 18-16 mesh aluminum insect screen in an aluminum frame.

C. Finish shall be 70% PVDF in a color selected by the Architect at the time of submittal review. Finish shall have a minimum of a 10 year warranty. Finish shall be suitable for coastal applications.

D. The performance standards shall be certified by the Manufacturer in accordance with the AMCA Certified Ratings Program and the louver shall carry the AMCA Seal.

E. Louvers shall meet the requirements of AMCA 540 "Test Method for Louvers Impacted by Windborne Debris - Enhanced Protection".

F. Louvers shall meet the requirements of AMCA 550 "High Velocity Wind Driven Rain Resistant Louvers".

G. Louvers shall meet the requirements of the Miami-Dade County Building Code compliance Office "Miami-Dade Notice of Acceptance".
1. Miami-Dade County Protocols Compliance:
   a. TAS-201 Large and Small Missile Impact Test.
   b. TAS-202 Uniform Static Air Pressure Test.
2. TAS-203 Cyclic Wind Pressure Test - Maximum Design Pressure Rating +/- 130 psf (6.7 kPa).

H. Performance Standards

1. Maximum static pressure drop through the free area - 0.1" W.C.

2. No water penetration at up to 800 FPM velocity through the free area.

3. Minimum free area in relation to gross overall area - 53%.

I. The basis of design is Ruskin. Acceptable equal manufacturers are Louvers & Dampers, Inc., Airolite, Greenheck, Nailor, and Construction Specialties.

3.0 EXECUTION

3.23 INSTALLATION

A. Units shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual devices to be provided with all trades.

B. All devices shall be free of leaks, provided completely finished, trimmed, adjusted, cleaned and ready for use. They shall be properly secured to the structure.

C. Louvers with ductwork connections shall have a minimum of 12" deep insulated sheetmetal plenum back-box.

D. Insulated sheetmetal blank-offs shall be provided over all inactive sections or sections for future tenant use of louvers where the Architectural size exceeds the mechanical requirements.

END OF SECTION

SECTION 23 81 26
SPLIT-SYSTEM AIR-CONDITIONERS

1.0 GENERAL

1.36 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.

B. This Section 23 81 26 and the accompanying drawings cover the provision of all labor, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the split systems as specified herein and as shown. This work includes, but is not limited to, the following:
1. Split system fan coil, heating section and condensing units
2. Control system (interlocked to all split system components)

C. Split system units shall be self-contained, automatic, packaged units. These units shall be completely factory-assembled as unitary packages complete with operating controls, internal wiring and piping and fully charged with R-410A refrigerant. Only one electrical power connection shall be required for each unit.

D. Units shall be UL listed and cooling capacities shall be certified in accordance with ANSI/AHRI 210/240.

1.37 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted split systems, as shown and specified, which operate efficiently and automatically, and are free of excessive noise and vibration.

1.38 BASIS OF DESIGN

A. The basis of design is as scheduled. Acceptable alternate manufactures include Trane, Carrier, Mitsubishi, Lennox, and Daikin for ducted systems except that Liebert systems are also acceptable for Server/IT spaces, and Carrier, Mitsubishi, LG, Hitachi, and Daikin for ductless mini-splits. Any proposed substitutions shall be submitted in accordance with the prior approval requirements.

2.0 PRODUCTS

2.24 UNIT CASINGS

A. Unit casings shall be formed, galvanized steel construction with welded assembly. Galvanized steel surfaces shall be bonderized and painted with baked acrylic enamel for complete weather protection. Accessories and components shall match and interlock with all other split system components. Fan coil unit casings shall be fully internally insulated with liner which meets NFPA 25/50 flame spread/smoke developed ratings.

2.25 CONDENSING UNITS

A. Condensing unit refrigeration systems shall be factory-charged and ready for operation. All units with capacities greater than five (5) tons shall be provided with minimum 2-stage (50% and 100%) cooling. Compressor(s) shall be direct drive, 3600 RPM, hermetic reciprocating type with centrifugal oil pump, crankcase heater and internal pressure relief valve. Compressor(s) shall have internal spring isolation and sound muffling and exhibit minimum vibration transmission and noise. Anti-recycle timers shall be provided to prevent excessive cycling of compressors thru utilization of a minimum five (5) minute time shutdown of unit on interruption of power or controlled shutdown.

B. Condensing unit condenser fans shall be direct-driven, propeller blade type. Condensing unit heat rejection shall be vertically upward.

2.26 COILS

A. Evaporator and condenser coils shall be copper tubing mechanically bonded to heavy duty aluminum fins. Aluminum tubes shall not be acceptable.

2.27 CONTROLS AND ACCESSORIES

A. All operating and safety controls which are internal to each unit shall be factory-installed and shall include, as a minimum, solid state compressor overload protection, magnetic contactors, thermostatic expansion valve(s), refrigerant line drier(s), outdoor fan and compressor cycling thermostats, high and low limit protection against excessive temperatures or pressures.

B. A 24 volt transformer shall be provided to accommodate an accessory 24 volt indoor thermostat complete with an electronic programmable night setback, separate automatic heat/cool settings, auto/manual fan control and seasonal selector. Thermostat shall provide staging of the cooling and heating to match the stages of each component. The thermostat shall have an LED display.

C. Automatic shutdown controls shall be provided on units ≥2,000 CFM to meet local Codes (or NFPA 90A as a minimum) and shall consist of firestats and duct-mounted smoke detectors interlocked to the fan coil unit for shutdown on the detection of fire or smoke.

2.28 FILTERS

A. Units shall have minimum 1 inch thick, low velocity, glass fiber throwaway filters in commercially available sizes.

3.0 EXECUTION

3.24 INSTALLATION

A. The split systems and associated controls shall be installed in strict accordance with the manufacturer's recommendations.

B. The control system shall be completely wired under this Division 23. Wiring shall be in accordance with the NEC and shall meet all requirements for this installation.

3.25 STARTUP

A. Provide the services of a factory-trained and qualified Service Technician employed by the Unit Manufacturer who shall inspect the installation including external interlock and power connections; supervise leak testing, initial operation, calibration of operating and safety controls and supervise electrical testing including insulation resistance of motors and voltage balance between phases during starting and running.

B. This Service Technician shall forward a report in four (4) copies to the Owner when the unit is in safe and proper operating condition. This report shall include all pressure and control settings, meg readings, voltage readings per phase during start and run, and shall list minor discrepancies to be corrected that affect safe and reliable operation. One additional copy of the report shall be left in the unit control panel. One copy of bound installation, operation, maintenance service and parts brochures, including applicable serial numbers, full unit description and parts ordering sources, shall be placed in the unit control panel at the time of startup; four (4) additional copies shall be forwarded to the Owner.

END OF SECTION
END OF SPECIFICATIONS

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION

CONSULTANTS

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BW&A Job No. 2024-1102

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN
ISLANDS

DATE: 03.14.2025
DRAWN BY: A. COBB
CHECKED BY: C. LYLES
APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D
CONTRACT NO.: -

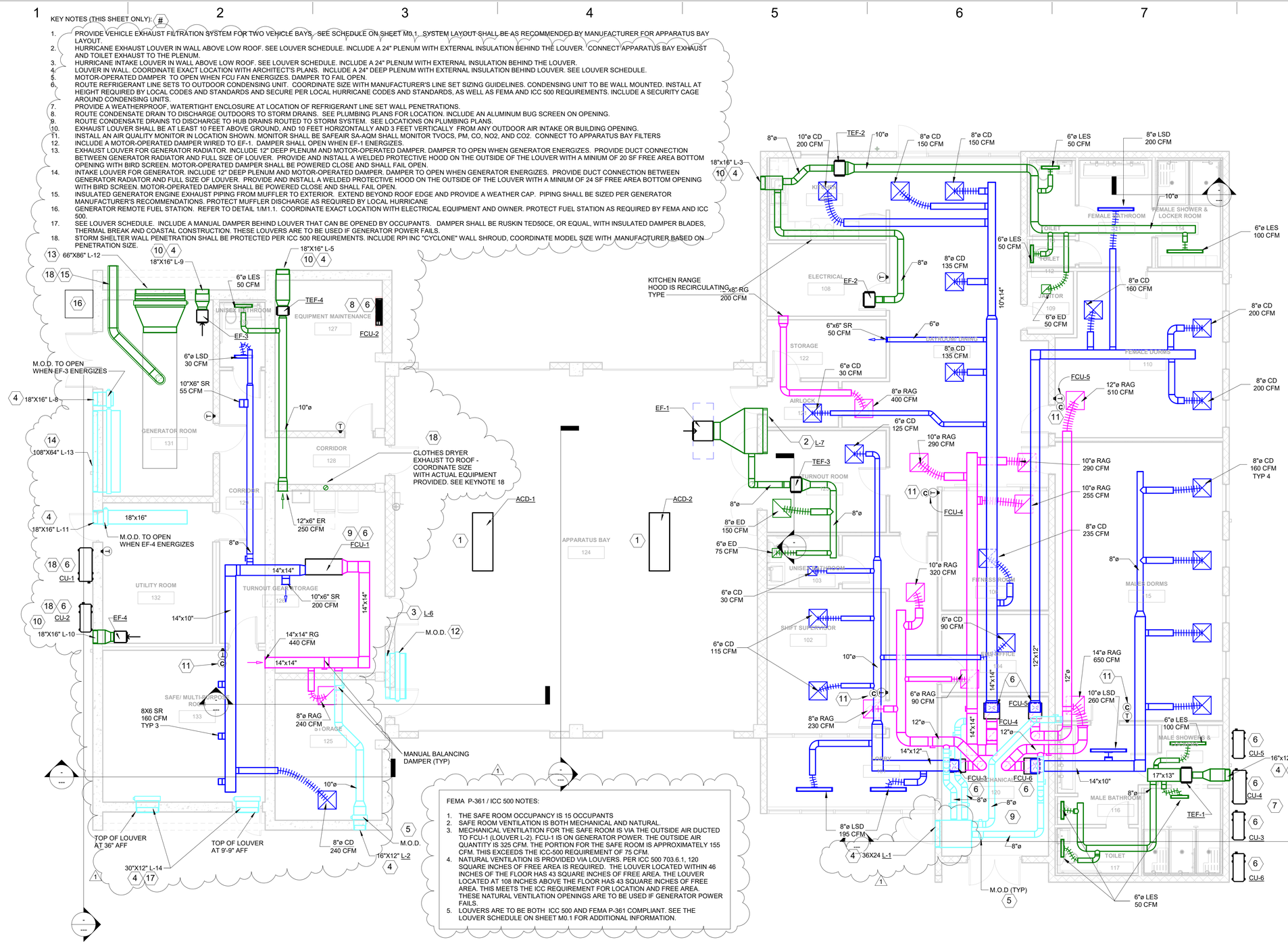
SHEET NO.: M0.6

MECHANICAL SPECIFICATIONS

PROFESSIONAL ENGINEER
CHRISTOPHER LYLES
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KEY NOTES (THIS SHEET ONLY): (#)

1. PROVIDE VEHICLE EXHAUST FILTRATION SYSTEM FOR TWO VEHICLE BAYS. SEE SCHEDULE ON SHEET M0.1. SYSTEM LAYOUT SHALL BE AS RECOMMENDED BY MANUFACTURER FOR APPARATUS BAY LAYOUT.
2. HURRICANE EXHAUST LOUVER IN WALL ABOVE LOW ROOF. SEE LOUVER SCHEDULE. INCLUDE A 24" PLENUM WITH EXTERNAL INSULATION BEHIND THE LOUVER. CONNECT APPARATUS BAY EXHAUST AND TOILET EXHAUST TO THE PLENUM.
3. HURRICANE INTAKE LOUVER IN WALL ABOVE LOW ROOF. SEE LOUVER SCHEDULE. INCLUDE A 24" PLENUM WITH EXTERNAL INSULATION BEHIND THE LOUVER.
4. LOUVER IN WALL. COORDINATE EXACT LOCATION WITH ARCHITECT'S PLANS. INCLUDE A 24" DEEP PLENUM WITH EXTERNAL INSULATION BEHIND LOUVER. SEE LOUVER SCHEDULE.
5. MOTOR-OPERATED DAMPER TO OPEN WHEN FCU FAN ENERGIZES. DAMPER TO FAIL OPEN.
6. ROUTE REFRIGERANT LINE SETS TO OUTDOOR CONDENSING UNIT. COORDINATE SIZE WITH MANUFACTURER'S LINE SET SIZING GUIDELINES. CONDENSING UNIT TO BE WALL MOUNTED. INSTALL AT HEIGHT REQUIRED BY LOCAL CODES AND STANDARDS AND SECURE PER LOCAL HURRICANE CODES AND STANDARDS, AS WELL AS FEMA AND ICC 500 REQUIREMENTS. INCLUDE A SECURITY CAGE AROUND CONDENSING UNITS.
7. PROVIDE A WEATHERPROOF, WATERTIGHT ENCLOSURE AT LOCATION OF REFRIGERANT LINE SET WALL PENETRATIONS.
8. ROUTE CONDENSATE DRAIN TO DISCHARGE OUTDOORS TO STORM DRAINS. SEE PLUMBING PLANS FOR LOCATION. INCLUDE AN ALUMINUM BUG SCREEN ON OPENING.
9. ROUTE CONDENSATE DRAINS TO DISCHARGE TO HUB DRAINS ROUTED TO STORM SYSTEM. SEE LOCATIONS ON PLUMBING PLANS.
10. EXHAUST LOUVER SHALL BE AT LEAST 10 FEET ABOVE GROUND, AND 10 FEET HORIZONTALLY AND 3 FEET VERTICALLY FROM ANY OUTDOOR AIR INTAKE OR BUILDING OPENING.
11. INSTALL AN AIR QUALITY MONITOR IN LOCATION SHOWN. MONITOR SHALL BE SAFEAIR SA-AQM SHALL MONITOR TVOCS, PM, CO, NO2, AND CO2. CONNECT TO APPARATUS BAY FILTERS
12. INCLUDE A MOTOR-OPERATED DAMPER WIRED TO EF-1. DAMPER SHALL OPEN WHEN EF-1 ENERGIZES.
13. EXHAUST LOUVER FOR GENERATOR RADIATOR. INCLUDE 12" DEEP PLENUM AND MOTOR-OPERATED DAMPER. DAMPER TO OPEN WHEN GENERATOR ENERGIZES. PROVIDE DUCT CONNECTION BETWEEN GENERATOR RADIATOR AND FULL SIZE OF LOUVER. PROVIDE AND INSTALL A WELDED PROTECTIVE HOOD ON THE OUTSIDE OF THE LOUVER WITH A MINIUM OF 20 SF FREE AREA BOTTOM OPENING WITH BIRD SCREEN. MOTOR-OPERATED DAMPER SHALL BE POWERED CLOSE AND SHALL FAIL OPEN.
14. INTAKE LOUVER FOR GENERATOR. INCLUDE 12" DEEP PLENUM AND MOTOR-OPERATED DAMPER. DAMPER TO OPEN WHEN GENERATOR ENERGIZES. PROVIDE DUCT CONNECTION BETWEEN GENERATOR RADIATOR AND FULL SIZE OF LOUVER. PROVIDE AND INSTALL A WELDED PROTECTIVE HOOD ON THE OUTSIDE OF THE LOUVER WITH A MINIUM OF 24 SF FREE AREA BOTTOM OPENING WITH BIRD SCREEN. MOTOR-OPERATED DAMPER SHALL BE POWERED CLOSE AND SHALL FAIL OPEN.
15. INSULATED GENERATOR ENGINE EXHAUST PIPING FROM MUFFLER TO EXTERIOR. EXTEND BEYOND ROOF EDGE AND PROVIDE A WEATHER CAP. PIPING SHALL BE SIZED PER GENERATOR MANUFACTURER'S RECOMMENDATIONS. PROTECT MUFFLER DISCHARGE AS REQUIRED BY LOCAL HURRICANE
16. GENERATOR REMOTE FUEL STATION. REFER TO DETAIL 1/M1.1. COORDINATE EXACT LOCATION WITH ELECTRICAL EQUIPMENT AND OWNER. PROTECT FUEL STATION AS REQUIRED BY FEMA AND ICC 500.
17. SEE LOUVER SCHEDULE. INCLUDE A MANUAL DAMPER BEHIND LOUVER THAT CAN BE OPENED BY OCCUPANTS. DAMPER SHALL BE RUSKIN TED50CE, OR EQUAL, WITH INSULATED DAMPER BLADES, THERMAL BREAK AND COASTAL CONSTRUCTION. THESE LOUVERS ARE TO BE USED IF GENERATOR POWER FAILS.
18. STORM SHELTER WALL PENETRATION SHALL BE PROTECTED PER ICC 500 REQUIREMENTS. INCLUDE RPI INC "CYCLONE" WALL SHROUD, COORDINATE MODEL SIZE WITH MANUFACTURER BASED ON PENETRATION SIZE.



FEMA P-361 / ICC 500 NOTES:

1. THE SAFE ROOM OCCUPANCY IS 15 OCCUPANTS
2. SAFE ROOM VENTILATION IS BOTH MECHANICAL AND NATURAL.
3. MECHANICAL VENTILATION FOR THE SAFE ROOM IS VIA THE OUTSIDE AIR DUCTED TO FCU-1 (LOUVER L-2). FCU-1 IS ON GENERATOR POWER. THE OUTSIDE AIR QUANTITY IS 325 CFM. THE PORTION FOR THE SAFE ROOM IS APPROXIMATELY 155 CFM. THIS EXCEEDS THE ICC-500 REQUIREMENT OF 75 CFM.
4. NATURAL VENTILATION IS PROVIDED VIA LOUVERS. PER ICC 500 703.6.1, 120 SQUARE INCHES OF FREE AREA IS REQUIRED. THE LOUVER LOCATED WITHIN 46 INCHES OF THE FLOOR HAS 43 SQUARE INCHES OF FREE AREA. THE LOUVER LOCATED AT 108 INCHES ABOVE THE FLOOR HAS 43 SQUARE INCHES OF FREE AREA. THIS MEETS THE ICC REQUIREMENT FOR LOCATION AND FREE AREA. THESE NATURAL VENTILATION OPENINGS ARE TO BE USED IF GENERATOR POWER FAILS.
5. LOUVERS ARE TO BE BOTH ICC 500 AND FEMA P-361 COMPLIANT. SEE THE LOUVER SCHEDULE ON SHEET M0.1 FOR ADDITIONAL INFORMATION.

1 / M1.0 MAIN LEVEL - MECHANICAL PLAN
3/16" = 1'-0"

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION
1	09/05/2025	REV 1

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ESTATE FORTUNA (TANGO CO.) FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

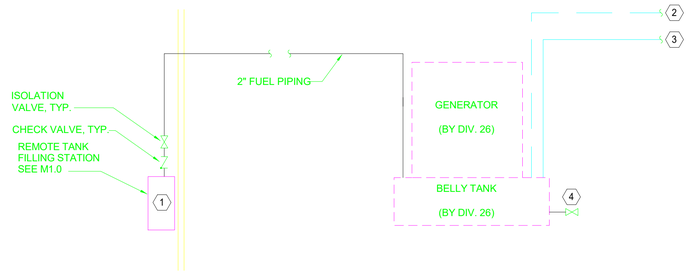
DATE: 03.14.2025
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APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: M1.0

MAIN LEVEL - MECHANICAL PLAN

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GENERAL NOTES:

1. COORDINATE WITH DIV. 26 FOR EQUIPMENT REQUIREMENTS.
2. PROVIDE CONTROL WIRING FROM FILLING STATION TO TANK LEVEL SENSORS, CONTROL VALVES, TANK PUMPS, ETC.
3. PROVIDE 120V POWER CIRCUIT FOR FILL STATION. COORDINATE WITH DIV. 26.
4. FUEL SYSTEM PIPING SHALL BE SCHEDULE 40 BLACK STEEL CONTAINMENT PIPING WITH WELDED JOINT. SLOPE IN DIRECTION OF FLOW AND PROVIDE DRAIN VALVES IN LOW POINTS.
5. ALL PIPING AND EQUIPMENT SHALL BE SIZED AND INSTALLED PER THE REQUIREMENTS OF NFPA 30 FOR CLASS II FUEL (DIESEL FUEL)
6. PIPE SUPPORTS SHALL BE FIRE RESISTANT CONSTRUCTION OR SHALL BE PROVIDED WITH A FIRE RESISTIVE COATING.
7. ALL PIPING SHALL BE TESTED PNEUMATICALLY TO TO 110% OF ANTICIPATED MAXIMUM SYSTEM PRESSURE (WITH MINIMUM OF 5 PSI) FOR 10 MINUTES.
8. ALL VENTS SHALL BE SIZED PER MANUFACTURER RECOMMENDATIONS AND ANSI/UL142

KEY NOTES:

1. REMOTE FILLING STATION SHALL BE SIMPLEX COMPACT AUTOMATIC FUELPORT (OR EQUAL). STATION SHALL BE 2" AND INCLUDE 7 GALLON CONTAINMENT. CONTROLLER SHALL INCLUDE LEVEL SENSOR, TANK FULL & HIGH LEVEL VISUAL / AUDIBLE ALARMS, TANK LEAK ALARM, ON/OFF POWER INDICATOR, VALVE CONTROLS AND TYPE 3R ENCLOSURE.
2. FULL SIZE TANK ATMOSPHERIC VENT FOR BELLY TANK. ROUTE OUTDOORS & TERMINATE 12 FT ABOVE GRADE WITH INSECT SCREEN.
3. FULL SIZE EMERGENCY PRESSURE RELIEF VENT FOR BELLY TANK. ROUTE OUTDOORS TERMINATE 12 FT ABOVE GRADE WITH INSECT SCREEN.
4. TANK DRAIN.

1 / M1.1 GENERATOR FUEL PIPING SCHEMATIC
NOT TO SCALE

REVISIONS

NO.	DATE	REMARKS
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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN
ISLANDS

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APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D
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SHEET NO.: M1.1

GENERATOR REMOTE FUEL FILL SCHEMATIC

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ABBREVIATIONS

A/C	ABOVE CEILING
AD	ACCESS DOOR
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AUTO	AUTOMATIC
AC	AIR CONDITIONING
AHU	AIR HANDLING UNIT
BAL	BALANCING
BDD	BACKDRAFT DAMPER
B/F	BELOW FLOOR
B/G	BELOW GRADE
B/FLY	BUTTERFLY
BHP	BRAKE HORSEPOWER
BCO	BASE CLEANOUT
CFM	CUBIC FEET PER MINUTE
CBCR	CURVED BLADE CEILING REGISTER
CD	CEILING DIFFUSER
CU	CONDENSING UNIT
CW	COLD WATER (DOMESTIC)
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
CON	CONCENTRIC
CO	CLEANOUT
COND	CONDENSATE
db	DRY BULB
DN	DOWN
DR	DRAIN
do	DITTO
dB	DECIBELS
DWG	DRAWING
EA	EACH
EAT	ENTERING AIR TEMPERATURE
ECC	ECCENTRIC
EF	EXHAUST FAN
EOD	EMERGENCY OVERFLOW DRAIN
ER	EXHAUST REGISTER
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EFF	EFFICIENCY
F	FAHRENHEIT
FCO	FLOOR CLEANOUT
FCU	FAN COIL UNIT
FSD	FIRE/SMOKE DAMPER
FD	FIRE DAMPER OR FLOOR DRAIN
FL DR	FLOOR DRAIN (only)
FLR	FLOOR
FOB	FLAT ON BOTTOM
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOT	FLAT ON TOP
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
G	GATE
GA	GAUGE
GPM	GALLONS PER MINUTE
GL	GLOBE
GCO	GRADE CLEANOUT
HD	HUB DRAIN
HP	HORSEPOWER
HTG	HEATING
HW	HOT WATER (DOMESTIC)
HWR	HOT WATER RETURN
HWRR	HOT WATER REVERSE RETURN
HWS	HOT WATER SUPPLY
Hz	HERTZ
ID	INSIDE DIMENSION
IN	INCHES
KW	KILOWATTS
LAT	LEAVING AIR TEMPERATURE
LB	POUNDS
LG	LINEAR GRILLE
LRG	LINEAR RETURN GRILLE
LWR	LOOP WATER RETURN
LWS	LOOP WATER SUPPLY
MIN	MINIMUM
MAX	MAXIMUM
MD	MANUAL DAMPER
MOD	MOTOR OPERATED DAMPER
MFR	MANUFACTURER
NC	NORMALLY CLOSED
NG	NATURAL GAS
NFWH	NON-FREEZE WALL HYDRANT
NO	NORMALLY OPEN
NOM	NOMINAL
OA	OUTSIDE AIR
OD	OUTSIDE DIMENSION
OBD	OPPOSED BLADE DAMPER
PIU	POWERED INDUCTION UNIT
PSI	POUNDS PER SQUARE INCH
RA	RETURN AIR
RAD	RADIUS
RAG	RETURN AIR GRILLE
RED	REDUCER
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
RAR	RETURN AIR REGISTER
SP	STATIC PRESSURE
SPS	STATIC PRESSURE SENSOR
SA	SUPPLY AIR
SAN	SANITARY
SD	SMOKE DAMPER
SEN	SENSIBLE
SQ	SQUARE
SR	SUPPLY REGISTER
ST	STORM
SS	SPLIT SYSTEM
TEMP	TEMPERATURE
TG	TRANSFER GRILLE
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VENT
VA	VALVE
VTR	VENT THRU ROOF
VAV	VARIABLE AIR VOLUME
wb	WET BULB
WC	WATER COLUMN
WHA	WATER HAMMER ARRESTOR
WT	WEIGHT
W	WASTE

PLUMBING LEGEND

	COLD WATER
	HOT WATER
	HOT WATER RECIRCULATION
	VENT
	SANITARY WASTE
	GAS
	WORK TO BE REMOVED
	FLOOR DRAIN
	HOSE BIBB
	FLOOR CLEAN-OUT
	WALL CLEAN-OUT
	GATE VALVE
	BALL VALVE

ELECTRIC WATER HEATER SCHEDULE

I.D. TAG	TYPE OF WATER HEATER	TANK CAPACITY (GALLONS)	RECOVERY @ 60°F (GPH)	POWER INPUT (KW)	VOLTS/ PHASE	BASIS OF DESIGN	REMARKS
WH-1	ELEC TANK	80	93	12.5	208/3	BRADFORD WHITE CEHD(A)	(1)
WH-2	ELEC TANK	28	21	3.0	208/3	BRADFORD WHITE LE230L3	(1)
IWH-A	INSTANT	--	--	1.8	120/1	EEMAX SPEX1812T	(2)

(1) PROVIDE EXPANSION TANK ON CW INLET; WATTS SERIES PLT OR EQUAL SIZED PER MANUFACTURER'S RECOMMENDATIONS. SEE DETAIL 2/P0.1 AND 3/P0.1
(2) 0.2 GPM ACTIVATION. INCLUDE AN INTEGRAL NEMA 4X DISCONNECT

PUMP SCHEDULE

I.D. TAG	FLUID	TYPE OF PUMP	FLOW (GPM)	HEAD (FT.)	MAX. NPSHR (FT.)	MAX. RPM	MOTOR H.P.	VOLTS/ PHASE	MINIMUM EFFICIENCY (%)	BASIS OF DESIGN	REMARKS
BP-1	WATER	DW PUMP	30	95	-	-	3	208/3	-	HYFAB MVP-630-208	(1)
HWRP-1	WATER	RECIRC.	5	20	-	-	1/12	120/1	-	B&G SERIES PL	(2)

(1) DUPLEX VARIABLE SPEED PRESSURE SKID MOUNTED BOOSTER PUMP WITH INTEGRAL CONTROL PANEL AND ISOLATION VALVES. SINGLE POINT POWER CONNECTION. PUMPS TO RUN AS PRIMARY/STANDBY. INCLUDE WATER WELL & PRESSURE BOOSTER EXPANSION TANK; WESSELS MODEL FXA-50, OR EQUAL, WITH 13 GALLON VOLUME.
(2) PROVIDE WITH STARTER, DISCONNECT AND AQUASTAT. PUMP TO RUN CONTINUOUSLY.

PLUMBING FIXTURE SCHEDULE

TAG	FIXTURE	CW	HW	SAN/ WASTE	VENT	REMARKS
P-1	WATER CLOSET, FLOOR-MOUNT	1/2"	-	4"	2"	
BASIS OF DESIGN: Kohler Kingston Comfort Height K-25077-RA. Fixture shall be vitreous china, elongated bowl, 1.28 gpf, floor-mounted, tank-type water closet. Fixture shall be two-piece, have Class Five flushing system, and shall include chrome trip level, elongated Quiet-Close toilet seat Kohler K-20110 or approved equal, chrome-plate supply stops and level, tank attachment kit, tank cover, flush valve unit, anti-siphon float valve, bolt cap covers, etc. as needed for a full and complete system.						
P-2	LAVATORY, 3 STATION	1/2"	1/2"	2"	2"	
BASIS OF DESIGN: Sloan AER-DEC Model AD-83000 "BASYS" 3-station, wall-mounted sink. Material shall be corain or Quartz, as selected by Owner. Front style shall be as selected by owner. Fixture shall include concealed carrier and anchoring screws, and 1 1/4" drain. Faucet hole-punch shall match provided faucet. Faucet shall be Sloan EFX-350-BAT-ISM Chrome-plated, battery-powered, sensor operated, deck-mounted faucet with 0.5 GPM aerator Include integrated side mixer for user adjustable water temperature. Include Sloan ESD-410 chrome-plated, battery powered, sensor operated foam soap dispenser. Provide with chrome plated tailpieces, chrome grid drain, P-trap, loose key supply stops and all other trim. Coordinate quantity of drains and faucets with sink. See sink submittal for drain and water line locations. Fixture shall be installed to meet all ADA requirements.						
P-3	LAVATORY, WALL-MOUNT	1/2"	1/2"	2"	2"	
BASIS OF DESIGN: Kohler Greenwich K-2032. Fixture shall be white vitreous china, wall-mount lavatory with concealed carrier and anchoring screws, and 1 1/4" drain. Faucet hole-punch shall match provided faucet (3-hole on 4" centers) plus hole punch for soap dispenser. Faucet shall be Kohler "Coralais" Model K-15199 single-handle, centerset faucet with 0.5 gpm aerator. Provide with chrome plated tailpieces, chrome grid drain, P-trap, loose key supply stops and all other trim. Fixture shall be installed to meet all ADA requirements. Provide and install point of use mixing valve rated in accordance with ASSE 1070 on the hot water connection.						
P-4	URINAL, WALL-MOUNT	3/4"	--	2"	2"	
BASIS OF DESIGN: Kohler Dexter, Model K-5452-ET. Fixture shall be white vitreous china, wall-mount, siphon jet urinal with 3/4" top spud and 0.125 gpf. Flush valve shall be manual operated Kohler K-76317-CP 0.125 gpf or approved equal.						
P-5	SHOWER	1/2"	1/2"	2"	2"	
BASIS OF DESIGN: Showers base shall be 60"x42" Kohler Model K-8659 "Rely". Include chrome-plated shower drain, Kohler Model K-9132. Valve and headset shall be Delta T13H152 anti-scald, balanced shower mixing valve with pressure balanced handle, 1.5 GPM wall mounted showerhead with spray and volume control, 70" vinyl handshower hose, stainless steel 24" slide bar and 24" grab bar. Include chrome-plated shower curtain rod and shower curtain. Coordinate all accessories for a full and complete ADA installation. ADA SHOWER shall match, expect shall include a fold down shower seat as selected by Owner						
P-6	SHOWER	1/2"	1/2"	2"	2"	
BASIS OF DESIGN: Showers base shall be 60"x34" Kohler Model K-8649 "Rely". Include chrome-plated shower drain, Kohler Model K-9132. Valve and headset shall be Delta T13H152 anti-scald, balanced shower mixing valve with pressure balanced handle, 1.5 GPM wall mounted showerhead with spray and volume control, 70" vinyl handshower hose, stainless steel 24" slide bar and 24" grab bar. Include chrome-plated shower curtain rod and shower curtain. Coordinate all accessories for a full and complete ADA installation. ADA SHOWER shall match, expect shall include a fold down shower seat as selected by Owner						
P-7	JANITOR'S SINK	1/2"	1/2"	3"	2"	
BASIS OF DESIGN: Stern-Williams Cornaro Model SBC-1500. Fixture shall be a Terrazzo floor service sink, 24" x 24" x 12" high, complete with one-piece stainless steel cap all-around top edge, cast brass 3" caulked drain with stainless steel strainer. Faucet set shall be Stern-Williams T-10-VB sink fitting complete with wall brace, hose end, vacuum breaker and chrome finish. Provide and install 24" tall stainless steel splash guards on all adjacent walls.						
P-8	BREAK SINK	1/2"	1/2"	2"	2"	
BASIS OF DESIGN: Elkay Model LR2521. Break sinks shall be single compartment, 18 gauge stainless steel with sound-deadening, 25" x 21-1/4" outside dimensions, 21" x 15-3/4" inside dimensions with an 8" depth. Faucet punching shall be 3 hole and shall be complete with Kohler Model K-15173, single handle faucet with 10" swing spout, and hand spray. Include 1.5 GPM aerator. Provide stainless steel removable crumb cup strainers and drains complete with service stops, tailpieces, P-trap and all trim.						
P-9	UTILITY SINK	1/2"	1/2"	2"	2"	
BASIS OF DESIGN: Sink shall be Fiat FL-1 laundry tub with Symmetrix S-249 faucet set. Provide chrome-plated tailpieces, strainers, P-trap, loose key supply stops, and all other trim.						
P-10	EYEWASH	1/2"	1/2"	1-1/2"	AAV	
BASIS OF DESIGN: Guardian G1814P. Fixture shall be wall-mounted, with 11-3/4" orange plastic bowl, 1/2" chrome-plated brass stay-open ball valve, two spray heads with flip top dust covers. Include chrome plated tailpiece and trap. Include Guardian Model G6021-XXX Thermostatic mixing valve installed in surface mounted powder coated steel cabinet. Route 1/2" hot and cold water to mixing valve, then 1/2" tempered water to eyewash. Include chrome plated brass tailpiece and p-trap with 1-1/2" IPS waste connection.						
FD	FLOOR DRAIN	1/2" TP	--	3" U.O.N.	2"	

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION

CONSULTANTS

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BW&A Job No. 2024-1102

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

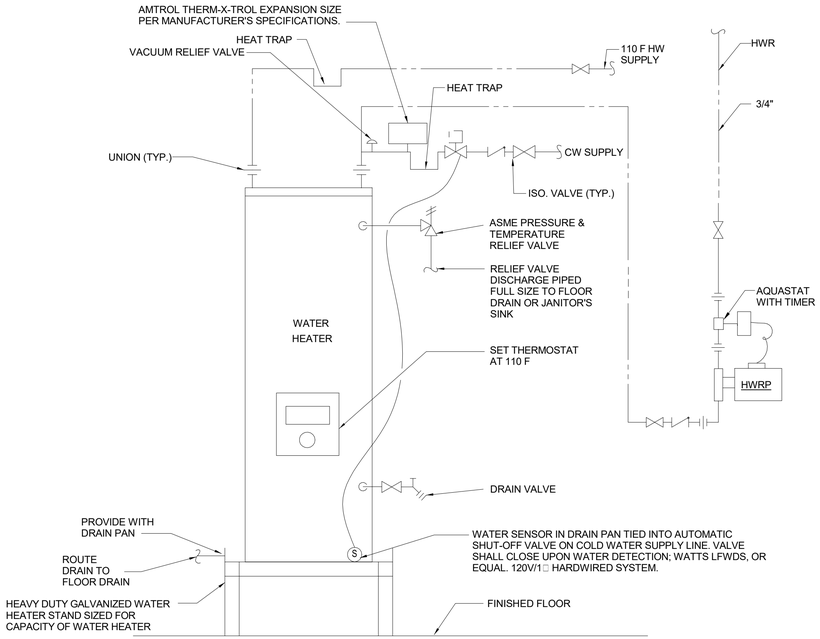
DATE: 03.14.2025
DRAWN BY: A. COBB
CHECKED BY: C. LYLES
APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D
CONTRACT NO.: -

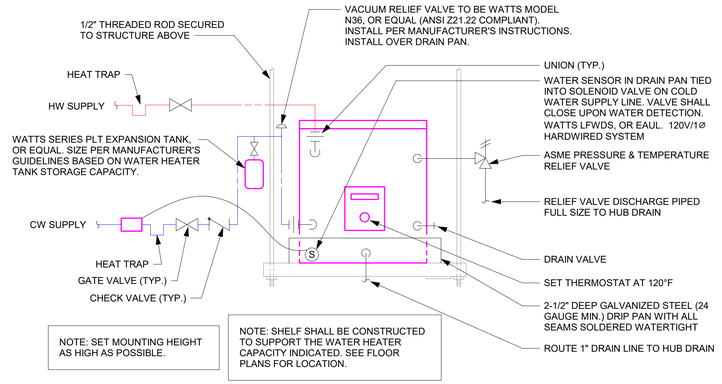
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PLUMBING SCHEDULES

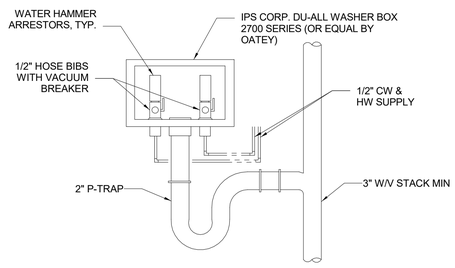
PROFESSIONAL ENGINEER
CHRISTOPHER LYLES
17841-E
U.S. VIRGIN ISLANDS



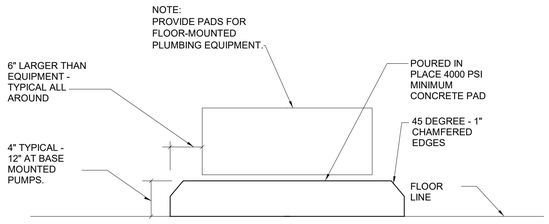
1 P0.2 WATER HEATER DETAIL
NOT TO SCALE



2 P0.2 SMALL WATER HEATER DETAIL
12" = 1'-0"



3 P0.2 LAUNDRY BOX DETAIL
NOT TO SCALE



4 P0.2 PLUMBING EQUIPMENT PAD DETAIL
NOT TO SCALE

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

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ST. THOMAS, U.S. VIRGIN ISLANDS

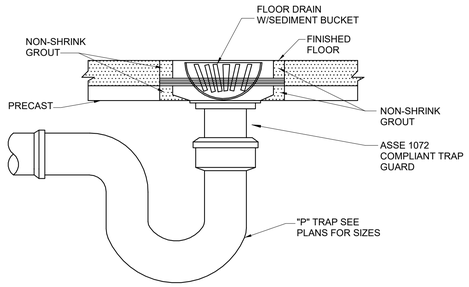
DATE: 03.14.2025
DRAWN BY: A. COBB
CHECKED BY: C. LYLES
APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D
CONTRACT NO.: -

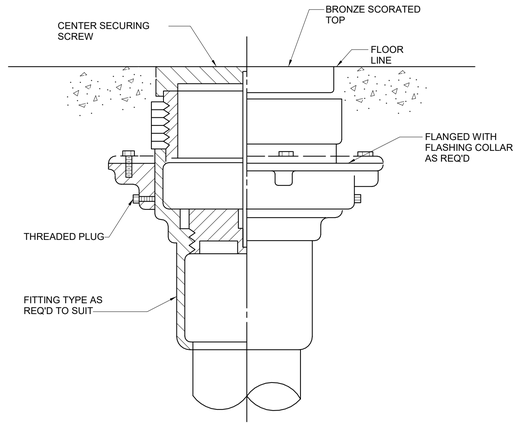
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PLUMBING DETAILS

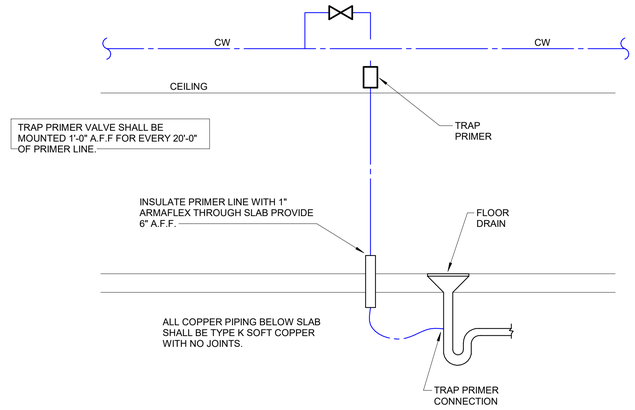
PROFESSIONAL ENGINEER
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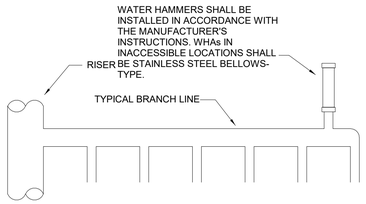
1 P0.3 FLOOR DRAIN DETAIL
NOT TO SCALE

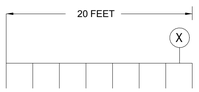


2 P0.3 FLOOR CLEANOUT DETAIL
NOT TO SCALE

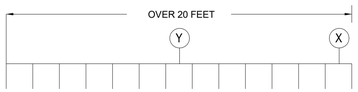


3 P0.3 TRAP PRIMER CONNECTION DETAIL
NOT TO SCALE





RULE 1



RULE 2

RULE 1: COVERS MULTIPLE FIXTURE BRANCH LINES WHICH DO NOT EXCEED 20' IN LENGTH.

RULE 2: COVERS MULTIPLE FIXTURE BRANCH LINES WHICH DO EXCEED 20' IN LENGTH.

*** NOTE: REFER TO STANDARD PDI-WH 201 FOR SIZING AND INSTALLATION.

4 P0.3 WATER HAMMER ARRESTOR DETAIL
NOT TO SCALE

REVISIONS

NO.	DATE	REMARKS
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CONSULTANTS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN
ISLANDS

DATE: 03.14.2025

DRAWN BY: A. COBB

CHECKED BY: C. LYLES

APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D

CONTRACT NO.: -

SHEET NO.: P0.3

PLUMBING DETAILS

PROFESSIONAL ENGINEER
CHRISTOPHER LYLES
1751-E
U.S. VIRGIN ISLANDS

Rainwater Management Solutions, Inc.
2550 Shenandoah Avenue NW
Roanoke, VA 24017
540-375-6750 | www.rainwatermanagement.com

February 14, 2025

JMP Equipment Company, LLC
PO Box 16706
Greensboro, NC 27416

RE: CVFS

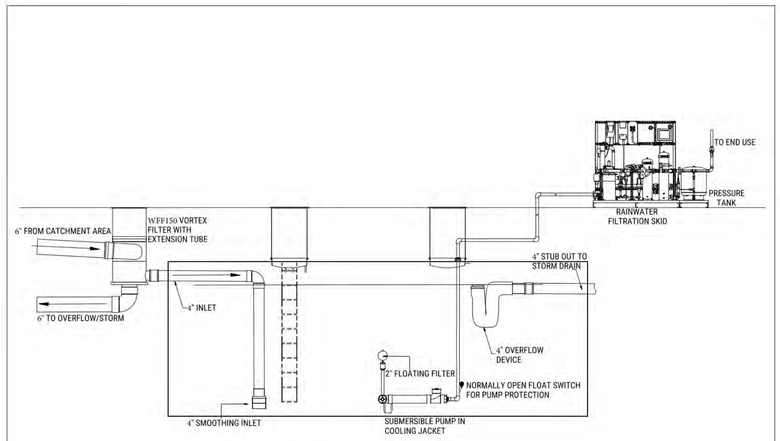
The information provided below is for cost estimating purposes only and should not be construed as a formal estimate or a quote for equipment and/or services until such time as equipment and design are approved by the engineer of record. The equipment noted below appears to fulfill the requirements of the proposed system based on information provided by Angela Cobb of BW&A.

Contact Rainwater Management Solutions, Inc., Andrew Harrison at 540-375-6750 for additional information.

This table summarizes your current estimate activity. Please review this information and let us know if you have any questions.

The following is a general breakdown of the inclusions RMS will be providing:

Item	Description	Qty
	Pre-Filtration, Pumps, and In-Tank Accessories	
1.	WFF150 Vortex Filter with 20" extension tube. Filters up to 5,500 SF, 280 micron stainless steel filter insert, 6" inlet, 6" debris outlet, 4" filtered water outlet. Includes housing, upper ring, lid, 12" handle, and filter insert.	1
2.	4" Stainless Steel Smoothing Inlet	1
3.	4" Overflow Multisiphon with drain back flow prevention and vermin guard	1
4.	Float Anchor Assembly	1
5.	1.5 HP Submersible Pump and Motor housed in a manufacturer-approved cooling jacket with (2) floating filter intakes, a check valve, and a pitless adapter for quick disconnect	2
6.	Float Switch, for dry-run protection	1
7.	Submersible Level Sensor, includes additional weight and cable clamp fastener	1
	25 GPM Treatment Skid	
8.	16 Gallon Pressure Tank, non-ASME	1
9.	2" Automatic Self-Cleaning Filter, 80 Micron Woven Screen	1
10.	5 Micron Sediment Cartridge Filter, with (24) replacement cartridges	1
11.	Carbon Cartridge Filter, with (24) replacement cartridges	1
12.	Ultraviolet Light rated for 30 GPM, includes (1) replacement bulb and sleeve	1
13.	Differential Pressure Sensor with LCD display.	1
14.	Variable Frequency Drive, for submersible pumps	2
15.	Single Point Power Source	1
16.	RMS 200 Controller - U.L. Listed PLC Color Touchscreen Control System with 10.4" screen	1
17.	1/4" Carbon Steel Skid powder coated safety blue, unistruts for equipment mounting, plumbed in L-Type copper press-fit.	1
18.	1.5" 2-Way Motorized Ball Valve	1
19.	1.5" Flow Meter	1
	Pressure Tank (loose shipped)	
20.	80 Gallon Pressure Tank, non-ASME	1
	Services Provided	
21.	Drafting, Submittals, and O&M Manual creation	1
22.	Remote startup and Training Services, 1-Day (6 hours).	2



RMS RAINWATER MANAGEMENT SOLUTIONS

SYSTEM SCHEMATIC
SUBMERSIBLE PUMP TO FILTRATION SKID

ALL GRADES & ELEVATIONS TO BE SITE VERIFIED PRIOR TO CONSTRUCTION

DRAWN BY: CR 6/28/2018
CHECKED BY: BS 6/28/2018
REV 0
NOT TO SCALE

DRAWING FOR ILLUSTRATIVE PURPOSES ONLY. NOT FOR CONSTRUCTION.
DIMENSIONS AND LAYOUT SUBJECT TO CHANGE
RAINWATER MANAGEMENT SOLUTIONS, 1-866-653-8337
WWW.RAINWATERMANAGEMENT.COM

REVISIONS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE: 03.14.2025
DRAWN BY: A. COBB
CHECKED BY: C. LYLES
APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: P0.4

PLUMBING DETAILS - CISTERN DW PUMP & FILTRATION SYSTEM

PROFESSIONAL ENGINEER
CHRISTOPHER LYLES
1784-E
U.S. VIRGIN ISLANDS

SECTION 22 05 00
COMMON WORK RESULTS FOR PLUMBING

1.0 GENERAL

1.01 DESCRIPTION

A. This Division 22 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the plumbing systems as specified herein and as shown.

B. All work specified in this Section is governed by the Common Work Results for Plumbing 22 05 00.

C. The General Provisions and Division 1, including the general, supplementary and other conditions and other Divisions, as appropriate, apply to work specified in this Division.

1.02 INTENT OF DRAWINGS AND SPECIFICATIONS

A. The implied and stated intent of the drawings and specifications is to establish minimum acceptable standards for materials, equipment and workmanship, and to provide operable plumbing systems complete in every respect.

B. The engineering drawings are diagrammatic, intended to show general arrangement and sizes of system components, and shall not be scaled. Rather, the architectural and structural drawings shall govern space constraints, dimensions and finishes. All offsets and fittings which will be necessary to accomplish the finished installation shall be provided at no additional cost or increase in the Contract.

1.03 SPACE PRIORITY

A. Ensure optimum use of available space for materials and equipment installed above ceilings. Allocate space in the order of priority as listed below except as otherwise detailed. Items are listed in the order of priority, with items of equal importance listed under a single priority number.
1. Gravity flow piping systems
2. Vent piping systems
3. Recessed lighting fixtures
4. Concealed HVAC terminals and equipment
5. Air duct systems
6. Sprinkler piping systems
7. Pressurized piping systems
8. Electrical conduit, wiring, control air tubing

B. Order of space priority does not dictate installation sequence. Installation sequence shall be as required to install all affected trades.

C. The work of this Division 22 shall not obstruct access for installation, operation and maintenance of the work of any other Division.

D. All major items of equipment shall be arranged so as to provide a minimum of 28" clear aisle space. Additional space shall be provided between and around equipment for maintenance and proper operation as shown in the Equipment Manufacturer's literature.

1.04 COORDINATION

A. Coordinate all work under this Division 22 with work under all other Divisions, providing adjustment as necessary.

B. Coordination of space requirements with respect to Division 26 shall be performed such that:

1. No equipment, piping or ductwork, other than electrical, shall be installed within 42" of switchboards or panelboards.
2. No piping or ductwork which ever operates at a temperature in excess of 120°F shall be installed within 3" of any electrical conductor.

C. All items mounted in or below the ceiling, and all items penetrating the ceiling, shall be coordinated with the architectural reflected ceiling plans. If any items are not shown on these plans, or any items need to be relocated for coordination purposes, prepare a reflected ceiling plan and submit it to the Architect for approval.

1.05 CODE COMPLIANCE

A. All workmanship and materials provided under this Division 22 shall comply with all laws, ordinances, codes and regulations of all Federal, State and Local Authorities Having Jurisdiction.

B. All fire suppression, plumbing, heating, ventilating, and air conditioning materials and workmanship shall comply with all local, state, and federal codes.

C. Secure and pay all fees associated with all permits and licenses required for execution of the Contract. Arrange for all inspections required by City, County, State and other Authorities Having Jurisdiction, and deliver certificates of approval to the Architect.

D. The code requirements are strictly a minimum and shall be met without incurring additions to the Contract. Where requirements of the drawings or specifications exceed the code requirements, the work shall be provided in accordance with these drawings or specifications. In the event of conflict or ambiguity between the various codes, the most stringent requirement shall govern.

1.06 ELECTRICAL REQUIREMENTS AND INTERFACE

A. All electrical equipment and wiring provided under this Division 22 shall comply with the electrical system characteristics indicated on the electrical drawings and specified in Division 26.

B. Electric controls, contactors, starters, pilot lights, push buttons, etc., shall be provided complete as part of the motor, heater or other equipment which it operates. All electrical components shall be in conformance with the requirements of the National Electrical Code and Division 26. Starters shall be wye-delta, closed transition type. Reference Division 26 and the electrical engineering drawings for those motor starters provided under that Division 26. All starters not shown shall be provided under this Division 22. Unless specified otherwise under other individual equipment Sections, motor starters shall conform to the following minimum requirements:

1. Starters for motors 1/3 horsepower or smaller shall be manual unless remote or automatic starting is required, in which case the starters shall be magnetic, full voltage, non-reversing, single-speed, unless otherwise indicated. All other starters shall be magnetic.

2. Each starter for a three-phase motor shall be furnished with three (3) overload relays sized for the full load running current of the motor actually provided. Provide an external "HAND-OFF-AUTO" selector switch with red "RUNNING" light. Provide a green pilot light to indicate motor "STOPPED". Each pilot light shall have a legend plate indicating reason for signal.

3. Each overload relay shall have a normally open alarm contact which will close only when actuated by an overload (not to be confused with N.O. or N.C. auxiliary contacts). These contacts shall be properly wired to their respective blue pilot light provided on the starter front cover and having a "TRIPPED" legend plate.

4. Individually mounted motor starters shall be in a NEMA Type 1 general purpose enclosure in unfinished areas and shall be flush mounted in all finished areas. All starters mounted in exterior areas shall have a NEMA 3R enclosure. Each starter shall have a laminated nameplate to indicate equipment unit number, function and circuit number.

5. All motor starters, push buttons and pilot lights shall be of the same manufacturer as the switchboard and shall be General Electric, Square D, Siemens I.T.E., or Westinghouse.

C. Motor starters for the following equipment shall be provided under this Division 22 by the Manufacturer of the equipment:
1. Packaged booster pump systems
2. Other equipment hereinafter specified in other Sections to be provided with integral starters

D. Unless otherwise noted or specified in individual Sections, all 3-phase motors shall be standard NEMA continuous duty "B" type, with Class B insulation, open drip-proof frame for indoor service, TEFC for outdoor service and a service factor of 1.15. All motors 5 HP and larger shall be U.S. Motors Hi-Efficiency Model or Reliance XE Hi-Efficiency Model.

E. All power wiring and final connections to equipment shall be provided under Division 26.

F. Control components, all interlocks (control valves, leak sensors, etc.) and control wiring (120 volt, single phase and less) shall be provided under this Division 22 as required to achieve the specified control sequences.

G. All control wiring over 30 volts shall be installed by a Licensed Electrician working under this Division 22.

1.07 SLEEVES, SEALS AND ESCUTCHEONS

A. Sleeves shall be provided through all pipe penetrations of concrete or masonry walls, elevated floors and roofs, except those plumbing piping penetrations for fixtures, vents, etc.

B. Sleeves shall be fabricated from Schedule 40 steel pipe through 10" and Standard Wall steel pipe for sleeve sizes 12" and larger. All sleeves penetrating exterior walls, underground walls, pit or vault walls shall be provided with a 3" x 3/8" thick waterstop ring welded completely to the midpoint of the sleeve.

C. All sleeves penetrating exterior walls, underground walls, pit or vault walls and elevated floors shall be packed and sealed watertight.

D. Sleeves through roofs shall extend above the roof surface and be flashed watertight.

E. Sleeves through walls shall be cut and finished flush with each surface of the wall in which they are installed.

F. Sleeves through elevated floors shall extend at least ½" above the finished floor and be sealed waterproof between the sleeve and slab.

G. Sleeves shall be sized to provide a minimum of 1/2" clearance between the inside surface of the sleeve and the outside finished surface of the pipe plus any insulation specified.

H. Fire-stops shall be provided as specified herein. All annular spaces between piping and sleeves which do not require fire-stops shall be packed with mineral wool and caulked.

I. Fire-stopping or packing at elevated floor penetrations shall be level with or above the elevation of the top of sleeve to prevent any water ponding on top of the sleeve.

J. Provide round, chrome-plated escutcheons on all exposed piping penetrations passing through walls, floors, partitions and ceilings.

K. All penetrations through rated slabs, walls, etc. shall be in accordance with UL listed systems. Provide rated box-out, fire caulking, etc. as needed to ensure fire rating is maintained in compliance with UL listed systems.

1.08 FIRESTOPS

A. Where piping, conduit, etc. pass through fire partitions, fire walls and floors, a firestop shall be provided that will ensure an effective barrier against the spread of fire, smoke and gases. Firestop material shall be packed tight and completely fill gaps between the ductwork, piping, conduit, etc. and the perimeter of their rough openings.

B. All penetrations shall be in accordance with UL 1479 or ASTM E 814 listed systems, and products used shall be specifically applicable for the appropriate installation conditions. Assemblies shall provide a minimum rating equal to the construction penetrated. Products shall be by HILTI, 3M, or ProSet.

C. Installation shall be by a Qualified Installer. Installer shall be certified, licensed, or otherwise qualified by the Firestopping Manufacturer as having the necessary training to install the Manufacturer's specific product. A Manufacturer or Vendor's willingness to sell the firestopping product to the Contractor or Installer does not in itself confer qualification.

D. Installer shall have at least one of the following qualifications:
1. FM 4991 Approved Contractor
2. UL Approved Contractor
3. HILTI, 3M, or ProSet Accredited Fire Stop Specialty Contractor

E. Installing Firm shall have no less than 3 years of experience with firestop installation.

F. A Manufacturer's direct Representative (not Distributor or Agent) shall be on site during initial installation of firestop systems to train appropriate Contractor personnel in proper selection and installation procedures.

G. The firestop Contractor or Installer shall supply As-Built documentation of each individual penetration location on the project. Documentation shall include a sequential location number, detailed description of the penetration location, size, and type, tested system number, type of assembly penetrated, and rating to be achieved. As-Built documentation shall be included with the close-out materials.

H. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach label permanently on both sides of penetrated construction in a visible location. The label shall include the following:
1. The words "Warning - Through Penetration Firestop System-Do Not Disturb"
2. Through Penetration firestop system designation and Manufacturer
3. Date of Installation

1.09 CORE DRILLING

A. Cutting of holes through concrete and masonry shall be by diamond core or concrete saw. Pneumatic hammer, impact electric and hand or manual hammer type drills will not be allowed, except as permitted by the Architect where required by limited working space. Locate holes such that they will not affect structural sections such as ribs or beams. Holes shall be laid out well in advance of the installation. These layout locations shall be approved by the Architect prior to drilling.

1.10 IDENTIFICATION OF PIPING

A. All aboveground plumbing systems piping and valves sized 3/4" and larger which are installed in accessible locations (including piping above removable ceilings and behind access panels) shall be identified in strict conformance with the "Scheme for the Identification of Piping Systems" (ANSI A13.1-2015)

B. Piping labels in exposed areas shall be oriented and located in coordination with the Architect.

C. System names shall, at minimum, uniquely identify the system and performance category - i.e. 140°F Hot Water Supply, High Pressure Cold Water, etc.

D. Specialized piping (grease waste, acid waste, fuel piping, etc.) installed underground shall be labeled. The label shall be corrosion resistant or shall be permanently marked.

E. Each identification marker shall include the following:
1. Proper color-coded background
2. Proper color of legend in relation to background color
3. Proper legend letter size
4. Proper marker length
5. Direction of flow arrow shall be included on each marker

F. Locations for pipe markers shall be as follows:
1. Adjacent to each valve and fitting
2. At each branch and riser take off
3. At each pipe passage through walls, floors and ceilings
4. On all straight pipe runs every 25 feet except that piping underground required to be labeled shall be labeled every 10 feet or more often as required by the AHJ

G. Identification markers may be stenciled or shall be Setmark Pipe Markers, as manufactured by Seton Name Plate Corporation.

H. All valves shall be identified with the appropriate service designation and valve number brass valve tags. Each valve tag shall be 19 gauge brass with 1/4" black-filled letters over 1/2" black-filled numbers. Tags shall be fastened to valves with brass "S" hooks or brass jack chain. Brass tags and fasteners shall be as manufactured by Seton Name Plate Corporation.

I. Provide charts of all valves. Valve charts shall include the following items:
1. Valve identification Number
2. Location
3. Purpose/Material

2.0 PRODUCTS

2.01 BID BASIS AND SUBSTITUTION PROCEDURES

A. Manufacturer names, series and model numbers, as noted or specified, are for the purpose of describing type, capacity, and quality of equipment, materials and products to be used. Unless "or equal" is specifically stated, bids shall be based only on the specified "basis of design" Manufacturer. The listing of a particular manufacturer as an "equal" or "acceptable substitute" manufacturer shall not be misconstrued as approving, nor allowing the substitution of, that Manufacturer's standard product in place of the basis of design. No consideration will be given to a product which would require dimensional, spatial or aesthetic changes to the project. "Acceptable substitute" and "equal" manufacturers shall only bid those products which exactly match the size and other characteristics of the specified basis of design. Any changes to other disciplines and trades of work required by an "or equal" or "substitute" product shall be duly considered and priced accordingly prior to bidding or pricing. The decision as to whether or not a proposed substitute or "equal" product is actually equal to that specified shall rest solely with the Architect.

B. Requests to provide "equal" products in lieu of those specified shall be submitted to the Architect in writing at least ten (10) days prior to final pricing and execution of the Contract. No consideration will be given to substitute products after final pricing and execution of the Contract.

C. Any "or equal" product or proposed product substitution which will cause a change in the appearance, dimensions or design of any part of the building, structure, electrical system, or any other engineered systems shall be accompanied by a scaled drawing and written description of the required change(s) for approval by the Architect. If deemed necessary by the Architect, design changes shall be signed and sealed by a registered Professional Engineer, currently licensed in this State. This shall be performed under the Contractor selecting the substitution's scope.

D. Any and all changes due to a substitution of basis of design equipment including but not limited to electrical connection, physical size, access, piping connections, controls, etc. shall be solely the responsibility of Contractor selecting the substitution.

2.02 MINIMUM STANDARDS

A. Every piece of energy consuming equipment, all fire suppression products and life safety equipment shall comply with the following standards as applicable; especially in regard to prevailing codes:
1. Factory Mutual Laboratories (FM)
2. Industrial Risk Insurers (IRI)
3. Underwriters Laboratories, Inc. (UL)
4. ADC: Air Diffusion Council
5. AGA: American Gas Association
6. AMCA: Air Moving and Conditioning Association, Inc.
7. ANSI: American National Standards Institute
8. API: American Petroleum Institute
9. AHRI: Air Conditioning, Heating, and Refrigeration Institute
10. ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers
11. ASME: American Society of Mechanical Engineers
12. ASTM: American Society of Testing and Materials
13. AWWA: American Water Works Association
14. IBR: Institute of Boiler and Radiator Manufacturers
15. MSS: Manufacturers Standardization Society
16. NBBPVI: National Board of Boiler and Pressure Vessel Inspectors
17. NEMA: National Electrical Manufacturer's Association
18. OSHA: Occupational Safety & Health Administration
19. PDI: Plumbing Drainage Institute
20. PPI: Plastic Pipe Institute
21. CISPI: Cast Iron Soil Piping Institute

2.03 PIPE HANGERS AND SUPPORTS

A. Pipe hangers, hanger rods, trapeze type hangers, upper attachments and other supports shall be selected based on pipe size (plus insulation of pipes specified to be insulated) and the weight of the medium being transported or the medium used for testing, whichever is greater. Provide all hangers and rods, turnbuckles, angles, channels, and other structural supports to support the piping systems. Rods for pipe hangers shall be full size of the Hanger Manufacturer's catalog listed rod size for each type hanger specified. Hangers and supports shall be Michigan, ITT Grinnell or B-Line.

B. All material utilized for the hanging and support of the piping systems shall be manufactured products which are specifically intended for the purpose of hanging piping systems. The use of wire, steel straps, plastic ties, etc. is strictly prohibited.

C. Pipe hangers selected for supporting horizontal insulated piping shall be sized to fit around the outside of the pipe insulation. Insulated piping shall be supported on galvanized shields.

1. Shields shall be as follows:
a. Pipes 2" and smaller: 18 gauge x 12" long
b. Pipes 2 1/2" and larger: 16 gauge x 18" long

2. Shields shall be 180 degrees around the lower half of the pipe at all pipe hangers, except that on trapeze hangers, pipe racks and floor supported horizontal pipes, shields shall be 360 degrees around the entire pipe.

D. Pipe hangers touching copper piping shall be copper plated or the piping shall be dielectrically isolated from any steel hangers or clamps that are used. Note the requirement for domestic water piping requires the hangers to be installed over the insulation.

E. Steel rods, framing and clamps shall be plated or primed to prevent rust formation.

3.0 EXECUTION

3.01 GENERAL

A. All piping, valves, and fittings shall be products of a domestic Manufacturer and made in the USA.

B. Flexible piping connections shall be provided and installed at all suction and discharge connections of packaged booster pumps and at any pump 2.0 HP and above. Flexible piping connections shall be suitable for 150 psi working pressure or the system pressure at the installation location, whichever is greater, and be suitable for the temperature of the system. Flexible connections shall be stainless steel braided hose type, with a length not less than their pipe diameter. Provide and install restraining rods if recommended by the Manufacturer for the installation location and application.

C. Provide and install shut-off valves at any and all equipment including water heaters, domestic booster pumps, recirculation pumps, storage and pressure tanks, etc. and at any locations required by code, such as branch lines from risers serving more than one fixture. Shut-offs shall be in addition to those specifically shown or noted in the Contract Documents.

3.02 SUBMITTALS

A. Before preparing submittals, study all Contract Drawings and specifications in detail, obtain manufacturer's recommended instructions, and have submittals prepared based on specific equipment and material proposed for installation. An officer of the contracting firm shall sign all shop drawings (certifying conformance with plans and specifications) before submitting to the Architect or releasing to the field.

B. The submittal process shall not be utilized as an avenue to substitute products after the execution of the contract. Should an unspecified or unequal product be submitted, it will be rejected. If a second attempt at substitution is made during the resubmittal of the same product, then no more reviews of that product will be performed without direct compensation to the Engineer being paid for the additional services required for the third review and any further reviews.

C. All submittals shall be submitted and returned electronically.

D. Submittals will not be accepted for review unless they:
1. Comply with the requirements of Division 1.
2. Include complete information pertaining to all appurtenances and accessories.
3. Are submitted as complete packages which pertain to all related items in Division 22. Separate packages shall be submitted as follows:
a. All plumbing equipment, piping, specialties, and components
b. All plumbing fixtures
4. Are properly marked with equipment, service or function identification as related to the project and are marked with pertinent specification paragraph number.

E. Submit catalog information, factory assembly drawings, field installation drawings and certifications as required for complete explanation and description of all items of equipment. The submittal data shall provide ample, unquestionable compliance with the Contract Documents.

F. Review of submittals shall not be construed as authorizing any deviations from the plans and specifications unless such deviations are clearly identified and separately submitted in the form of a letter that is enclosed with the submittals.

G. Submittals are required on all manufactured equipment, especially energy consuming equipment. Submittals shall include, but are not limited to, the following items of equipment:
1. Piping and Piping Specialties
2. Insulation
3. Water Heaters
4. Pumps
5. Plumbing Fixtures
6. Firestopping Products and Applicable UL Firestop Details

3.03 EXCAVATION, TRENCHING AND BACKFILLING

A. Perform all excavation, trenching and backfilling for underground work under this Division 22. During excavation, the excavated material shall be piled back from the banks of the trench to avoid overloading, slides or cave-ins. Do not exceed the angle of repose unless written approval is obtained in advance from the Architect for shoring, bracing or other alternate excavation methods. All excavated material not used for backfilling shall be removed from the building and disposed of as indicated or directed by the Architect. Take measures to prevent surface water from flowing into trenches and other excavations and any water accumulating therein shall be removed by pumping. All excavation shall be made by open cut. Tunneling shall not be allowed.

B. The bottom of all trenches shall be evenly graded to provide firm support and an even bearing surface. Pipe shall be laid on firm soil, laid in straight lines and on uniform grades. Provide bell holes so that the barrel of the pipe rests evenly on the bottom of the trench along the entire length of the pipe.

C. Pipe shall be inspected and tested prior to backfilling. Trench shall be handfilled to a minimum of 12" above the top of pipe with suitable earth (free of rocks, trash, large clods and organic material) and compacted to a minimum 95% proctor. After the first layer is completed, subsequent layers shall be filled and compacted the same as the first layer. Settling the backfill with water shall not be permitted.

3.04 INSTALLATION REQUIREMENTS

A. All equipment shall be installed in strict conformance with the recommendations of the Equipment Manufacturer, as indicated on the Drawings, and as specified.

B. Provide installation manuals for each piece of equipment. Submit in separately bound volumes after review of submittals.

C. Provide supplementary steel framing and welded steel equipment support stands as required for proper hanging and support of the plumbing systems. Steel angles, channels and tubing utilized for such framing shall be selected for a maximum deflection of 1/360th of the span.

D. All roof curbs shall be a minimum of 12" high and selected for the various roof pitches. Curbs installed on roofs having pitches of not more than 1/4" per foot may be standard curbs shimmed level with steel channels or Zs to provide suitable support and flashing surfaces.

3.05 CLEANING, LUBRICATION AND ADJUSTMENT

A. The exterior surfaces of all plumbing equipment, piping, conduit, etc., shall be cleaned and free of all dirt, grease, oil, paint splatter, and other construction debris.

B. Bearings that require lubrication shall be lubricated in strict accordance with the manufacturer's recommendations.

C. All control equipment, valves, equipment settings, pressure tanks, etc. shall be adjusted to the settings required for the performance specified.

D. All materials, equipment, etc. subject to weather, corrosion, dust, debris, water etc. to be installed or utilized for the project shall be fully protected. This is inclusive of piping and duct openings and internal fan ventilation intakes and

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION

CONSULTANTS

BW&A
Barrett, Woodyard & Associates, Inc.
3495 Holcomb Bridge Road
Norcross, GA 30092
Phone (770) 810-8800
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BW&A Job No. 2024-1102

JDG Jaredian Design Group
Architects, Engineers and Construction Managers
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e-mail: jaredlandesigngroup@gmail.com
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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE: 03.14.2025
DRAWN BY: A. COBB
CHECKED BY: C. LYLES
APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: P0.5

PLUMBING SPECIFICATIONS

PROFESSIONAL ENGINEER
CHRISTOPHER LYLES
17841-E
U.S. VIRGIN ISLANDS

discharges. This Division's scope includes protection and remediation of any and all Division materials, etc. including cleaning, vacuuming, dusting, etc. required for a clean system and operation. Insulation and equipment with electrical connections subject to water shall be replaced in their entirety. Coordinate with all other trades and schedules.

3.06 PAINTING

A. All uncoated and uninsulated steel surfaces exposed to sight inside the building, such as piping, equipment hangers and supports, which are not provided with factory prime coat or galvanizing, shall be cleaned and painted with one coat of rust inhibiting primer. In addition, all surfaces in finished spaces shall also be painted with two coats of finish paint in a color selected by the Architect.

B. Steel items exposed outside the building, such as equipment supports, uninsulated piping and hangers which are not factory painted or galvanized shall be cleaned and painted with one coat of rust inhibiting primer and two coats of asphaltic base aluminum paint. Insulated steel pipes outside the building shall be cleaned and painted with one coat of rust inhibiting primer before installing insulation.

C. Factory painted equipment that has been scratched or marred shall be repainted to match the original factory color.

3.07 PIPING LEAK TESTING

A. Sanitary, waste, storm, and vent piping shall be tested with water before installing fixtures. Water test shall be applied to the system either in its entirety or to the individual sections. Each opening except the highest opening of the section under test shall be plugged, and the section shall be filled with water and tested with a head of water of at least ten (10) feet above the highest point in the system. The water shall be kept in the portion under test, for at least thirty (30) minutes; no drop in the water level will be acceptable.

B. The water piping systems shall be tested at a minimum pressure of 125 psi, or 1.5 times the system operating conditions, whichever is greater, and proved tight at this pressure for not less than thirty (30) minutes or longer if required to permit inspection of all joints. No loss in pressure will be permitted.

C. All leaks shall be repaired by tightening, remaking joints, or replacing pipe and fittings. Caulking of joints shall not be permitted.

3.08 RECORD (AS-BUILT) DRAWINGS

A. At the completion of the project, provide a set of reproducible prints to the Architect which reflects all changes, deviations and revisions made to the original design documents. Locations of all underground piping and utilities shall be clearly shown and dimensioned from permanent reference points such as building column lines. Record drawings shall be produced in electronic format compatible with AUTOCAD. Furnish electronic copies of all drawings in dwg. format, and two (2) bond copies of all drawing sheets. As-Builts for electronic incorporation by the Design Team, as applicable, shall be redline mark-ups of the Construction Documents.

3.09 OPERATING AND MAINTENANCE MANUALS AND INSTRUCTIONS

A. Complete operating and maintenance manuals shall be provided to the Owner. Four copies shall be provided. Each copy shall be bound in a separate 3-ring, loose leaf notebook. Operating instructions shall be provided for each plumbing system, and shall each include a brief system description, a simple schematic and a sequence of operation. Operating and maintenance instructions shall be provided for each piece of equipment. A control system wiring diagram shall be included in each operating and maintenance manual.

B. Prior to final acceptance or beneficial occupancy, provide the services of a Competent Technician for not less than one (1) day to instruct the Owner in the operation of the plumbing systems.

3.10 MINIMUM HANGER SPACING

A. Pipe hangers or supports shall be provided within 18" of each horizontal fitting, equipment connection, valve, etc. and within 18" of the centerline of horizontal or vertical changes in direction summing to 90° or more. Specific attention is called to turns into vertical risers.

B. Piping supports shall be provided, at a minimum, in accordance with the greater of the below or code minimum. Where the below or code does not address support for specific piping, supports shall be in accordance with manufacturer's requirements.

Piping Material	Max. Horz. Spacing	Max. Vert. Spacing
Cast-iron pipe	5'	15'
Copper pipe	12'	10'
Copper tubing ≤ 1-1/4" dia.	6'	10'
Copper tubing ≥ 1-1/2" dia.	10'	10'
**CPVC pipe ≤ 1" diameter	3'	10"*
**CPVC pipe ≥ 1-1/4" dia.	4'	10"*
PVC pipe	4'	10"*
**PEX	32"	10"*

*Midstory guide required for piping 2" diameter and smaller

C. Riser clamps shall be provided at each floor penetration. For pressurized piping systems, provide vibration isolation at all riser clamps with two (2) pad-type mountings consisting of a minimum 3/8" thick ribbed or waffled elastomeric pads bonded between minimum 16-gauge galvanized steel separator plates. Pads shall be sized for a deflection of 0.12" to 0.16". Pads shall be minimum 3"x3" square.

3.11 WARRANTY

A. All work provided under this Division 22 shall be subject to a minimum one year warranty. The warranty shall include prompt repair or replacement of equipment or system failures and shall include all parts and labor. In addition, all compressors shall carry an additional four year parts-only warranty. Extended warranties shall be provided on all other equipment so specified in other Sections.

3.12 SHOP DRAWINGS

A. Shop drawings per the submittal requirements shall be submit to the Design Team with adequate time for multiple rounds of review. Shop drawings shall show "As-Built" conditions including elevations, offsets, transitions, and accessories. Shop drawings shall indicate all code and manufacturer's recommended clearances, access, and coordinate the clearance and access requirements with all other trades.

B. Shop drawings that use keynotes direct from the Design Documents shall not be acceptable as they do not demonstrate coordination with all other trades, necessary transitions, etc.

C. Shop drawings shall be provided as complete packages in parallel with all trades to document coordination. Floor-by-floor or otherwise piecemeal shop drawings are generally not acceptable.

3.13 OWNER TRAINING

A. Owner training shall be provided for all systems and equipment and shall include the following:
1. 8-hours of training for each type of equipment
2. 16-hours for overall system operational training

B. A training summary and schedule shall be submitted to the Architect for approval within ninety (90) days of the date of substantial completion.

C. Training timing will vary and shall be assumed to include multiple sessions as required by the Owner.

3.14 BID REQUIREMENTS

A. The Contractor shall include all systems, equipment and accessories shown on the plans and specifications.

B. The Contractor is responsible for providing all Contract Documents to all SubContractors. All systems, equipment and accessories shall be included in the bid, whether shown on the SubContractor applicable plans or other design documents.

C. Should any discrepancy occur in the Contract Documents, the Contractor shall provide a request for clarification prior to bid or note the discrepancy in the bid and provide an appropriate cost allowance in the bid.

D. The Contractor shall acknowledge that the Contract Documents are diagrammatic and shall provide all systems, equipment and accessories required for a complete facility. Any areas that appear to be void of systems or inappropriate systems shall be noted in the bid. No post bid change order shall be considered for areas or discrepancies not noted in the bid.

E. All installation coordination and means and methods and labor and materials required for proper system installation shall be included.

F. These requirements are in addition to bid procedures and requirements of the RFP or general specifications.

END OF SECTION

SECTION 22 07 00
PLUMBING INSULATION

1.0 GENERAL

1.11 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 07 00 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the insulation of the plumbing systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Sanitary waste and vent systems
2. Domestic water systems

1.12 INTENT

A. It is the intent of this Section of the specifications to provide complete and operable plumbing systems complete with insulation, which are free of unreasonable noise, vibration and sweating, and fabricated so as to fit the space allotted.

B. The word "piping" is defined to mean all piping, fittings, joints, hangers, coatings, valves, cocks, insulation and accessories necessary for the plumbing systems described, shown and specified.

1.13 ACCEPTABLE MANUFACTURERS

A. Insulation products shall be as manufactured by Owens Corning, Knauf, Manville, Certainteed, Dow, Armacell, or Armstrong.

2.0 PRODUCTS

2.04 PLUMBING INSULATION

A. All pipe insulation products shall have a permanent composite insulation, jacket and adhesive fire and smoke hazard rating as tested by procedure ASTM-84, NFPA 255 and UL 723 not exceeding Flame Spread 25 or Smoke Developed 50.

B. Preformed insulation for all domestic hot water piping shall be minimum 1-1/2" thick for piping less than or equal to 1-1/2" diameter, 2" thick for piping above 1-1/2" in diameter, preformed fiberglass pipe insulation with white all-service jacket. All longitudinal joints shall be lapped, self-sticking type with all butt joints, tears, etc. sealed with a matching white vapor barrier tape. Elbows shall be mitered or may be Zeston covers filled with equivalent fiberglass insulation. The maximum conductivity (k-value) of the insulation shall be 0.23 BTU per inch/h·ft^2·°F at 75°F.

C. Preformed insulation for all domestic cold water piping, except trap primer piping underground, shall be minimum 1" thick, preformed fiberglass pipe insulation with white all-service jacket. All longitudinal joints shall be lapped, self-sticking type with all butt joints, tears, etc. sealed with a matching white vapor barrier tape. Elbows shall be mitered or may be Zeston covers filled with equivalent fiberglass insulation. The maximum conductivity (k-value) of the insulation shall be 0.23 BTU per inch/h·ft^2·°F at 75°F.

D. Insulation shall be continuous over all valve bodies, fittings, and wall and floor penetrations. Do not insulate unions on hot water piping; nor instruments, gauges, valve handwheels, etc. on any piping.

E. Closed-cell insulation shall be provided over all piping called to have insulation that is installed below ground. Closed-cell piping insulation shall match the thicknesses for above ground piping, 25/50 Armaflex or Rubatex. All glues and coatings shall be products of the same manufacturer as the insulation. The insulation shall be installed by the slip-on method; slitting of the insulation is prohibited and shall be cause for rejection.

3.0 EXECUTION

3.15 ARRANGEMENT

A. Follow the general piping layout, arrangement, schematics and details. Provide all offsets, vents, drains and connections necessary to accomplish the installation. Fabricate piping accurately to measurements established at the project site to avoid interference with ductwork, other piping, equipment, openings, electrical conduits and light fixtures. Make suitable provision for expansion and contraction with expansion loops and offsets.

3.16 INSULATION INSTALLATION

A. Provide insulation over all above ground hot and cold water piping, except that no insulation is required on cold water lines installed inside interior plumbing chases (those chases with no exterior wall). In addition, no insulation is required for cold water piping outside the building vapor barrier and designed to be drained down for freeze-protection, such as parking deck hose bibbs for washdown.

1. All joints and tears shall be sealed with matching white vapor barrier tape

B. See specification 23 07 19 for HVAC piping insulation requirements.

END OF SECTION

SECTION 22 10 00
PLUMBING PIPING

1.0 GENERAL

1.14 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 10 00 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the plumbing systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Sanitary, waste, and vent systems
2. Domestic water systems
3. Storm Drainage Systems

C. Provide all final plumbing connections to all equipment furnished by Owner.

D. Provide isolation valve and reduced pressure backflow preventer or vacuum breaker at the service entrance and at those connections (especially to kitchen equipment) required by local plumbing code.

1.15 INTENT

A. It is the intent of this Section of the specifications to provide complete and operable plumbing systems as shown and specified which are free of leaks, properly vented, free of unreasonable noise, vibration and sweating, and fabricated so as to fit the space allotted and to exhibit a minimum resistance to fluid flow.

B. The word "piping" is defined to mean all piping, fittings, joints, hangers, coatings, valves, cocks, insulation and accessories necessary for the plumbing systems described, shown and specified.

1.16 GENERAL REQUIREMENTS

A. Provide all reducing fittings, flanges, couplings and unions of the size and type of material to match the piping connections at each fixture, piece of equipment, valve and accessory.

B. Union joints, couplings or flanges shall be provided in each pipe connected to each piece of equipment, fixture and elsewhere as indicated and specified. Unions shall match the piping system in which they are installed.

C. Unions or flanges shall be provided between all copper to steel connections. These unions shall be dielectric, insulating type.

D. All changes in direction and branches shall be made with manufactured fittings.

E. The use of offset-type reducers is strictly prohibited in any piping system.

F. In all water piping systems, changes in horizontal pipe sizes shall be made with eccentric reducers installed flat on top for proper air venting. Reducing tees, reducing elbows and concentric reducers shall only be allowed in water piping systems for changing pipe sizes in vertical risers and for making connections to equipment and accessories from vertical risers.

G. All pipe joints shall be cut square and all burrs shall be removed.

H. Open ends of pipes not currently being handled shall be plugged during installation to keep dirt, water, and foreign material out of the system.

I. Sanitary, waste, vent, and storm drainage piping shall slope down in the direction of flow as shown on the drawings or as prescribed by Code, but not less than 1 percent.

J. All vents through roof (VTRs) shall be offset just below the roof such that their termination points are at least 15 ft from any outside air intake of any HVAC unit; special attention is called to packaged rooftop and dedicated make-up air units.

K. Trap primers shall be provided at all floor drains, floor sinks, trench drains, and hub drains except trap primers may be omitted where drain routes to the storm system. Route water piping from nearest cold-water line and as allowed by code. Trap primer shall be tapped off the top of the horizontal line, have an isolation valve, and be at least 1' in elevation above the connection for every 20' of downstream piping.

L. All piping, valves, and fittings shall be provided by a domestic Manufacturer and manufactured in the USA.

2.0 PRODUCTS

2.05 SANITARY WASTE AND VENT SYSTEMS

A. All underground sanitary waste and vent piping shall be PVC, DWV Solid Wall Schedule 40 with socket-type, solvent welded joints in sizes up to 12". All PVC piping shall be installed in accordance to ASTM D2321.

B. All aboveground sanitary, waste, and vent piping shall be PVC. Piping shall be DWV Solid Wall Schedule 40 with socket-type, solvent welded joints in sizes up to 12".
1. Piping aboveground shall match the requirements for the underground piping as above.
2. Sanitary, waste, and vent piping less than or equal to 2.5" may be copper DWV. Piping shall meet ASTM B 75, B 88, B 251, and B 306.

C. Cleanouts shall be provided at the locations indicated and, as a minimum, where required by Code. Floor cleanouts shall be a minimum of 4" and shall be complete with a flush plug and removable, scoriated bronze floor plate. Provide carpet buttons in carpeted areas. Wall cleanouts shall be threaded cleanout tees and plugs with polished stainless steel coverplate with centerset screw.

D. All cleanouts located in areas that are subject to vehicular traffic shall be heavy duty, traffic rated, JR Smith Model 4253, with bronze cover or equal product by Josam or Zurn.

E. Check valves:

1. Valves in waste systems below ground shall match the material of the piping. Valves shall be cast iron with gasketed bolted cover or PVC ANSI 14 with inner riser assembly. Valves shall have hinged flappers.

2. All check valves on pump discharges shall be non-slam type.

3. All check valves shall be installed in an orientation allowed by the manufacturer's recommendations.

4. All check valves installed in insulated piping systems shall have the check valve location explicitly labeled on the outside of the insulation.

F. Floor drains in toilets and finished areas shall be JR Smith 2000 Series with 6" Type B square adjustable strainers finished in satin nickel bronze or equal products by Josam or Zurn. Provide vandalproof secured tops.

G. Floor drains in mechanical rooms and unfinished concrete floors shall be JR Smith 2131 Series with round 11 3/4" cast iron grate, sediment bucket and deep-seal P-trap; or equal products by Josam or Zurn. Provide vandalproof secured tops.

H. Hub drains (HD) shall be made with a reducer fitting with opening at least one nominal size larger than the connected piping as scheduled. HDs shall be sized to receive all discharges without splashing.

2.06 STORM PIPING SYSTEMS

A. Storm piping systems shall be of the same materials specified above in 2.01 for the sanitary, waste and vent systems.

B. The storm system is gutters and downspouts. The plumbing scope of work includes collecting the gutters and routing to the cistern.

C. The roof drains shall be selected for the insulated roof decks indicated. The roof drain bodies and receivers shall be of cast iron construction; domes shall be cast iron or aluminum and the roof drains shall be complete with flashing clamps having integral gravel stops, deck clamps, gaskets and trim. Roof drains shall be JR Smith 1010 or 1015 Series or approved equal products as manufactured by Josam, Zurn.

2.07 DOMESTIC WATER SYSTEM

A. Underground domestic water service entrance piping 3" and smaller in size shall be Type K hard drawn copper tubing with wrought copper fittings. All joints shall be brazed.

B. All underground copper branch lines (1/2" and 3/4" only) shall be continuous lengths of soft Type K copper tubing with no joints allowed underground.

C. Aboveground domestic water system piping 3" in size and smaller shall be Type L hard drawn copper tubing with wrought copper fittings and soldered joints.

D. Aboveground domestic water system piping 3" in size and smaller shall be as above or Type L hard drawn copper tubing with press-connect fittings with EPDM sealing elements and un-pressed fitting identification feature. Piping 2.5" and 3" shall have stainless steel grip ring, separator ring, and EPDM sealing element.
1. Fittings shall be by Viega, Victaulic, or Nibco.
2. Fittings shall be installed with a tool from the Fitting Manufacturer, or a method approved by the Manufacturer.
3. Fittings and tubes shall be appropriate for installation in a return air plenum.
4. Fittings and tubes shall be rated in accordance with ASME B31, B16.51, ASTM B88, NSF 61/372, and IAPMO PS 117.

E. As a deductive alternate - Downstream of the water entrance riser, aboveground domestic water piping shall be high-density cross-linked polyethylene (PEX-a). Piping shall conform to ASTM F876, ASTM F877, CSA B137.5, NSF/ANSI 14, and NSF/ANSI 61 and be rated for continuous pressure of 100 psi at 180°F. Piping shall have minimum installed bend radius in accordance with manufacturer's recommendations. Piping shall be co-extruded with UV resistance, rated for a minimum of 3 months. Piping shall be by Rehau, Uponor, or Viega.
1. Fittings shall be cold-expansion compression-sleeve type
2. Fittings shall be from the same manufacturer as the piping
3. All compression sleeves shall be made from PEX-a
4. Fitting and tube shall have ASTM F876 standard listing and certification
5. Fitting certifications shall match piping certifications
6. Supports shall be in accordance with manufacturer's recommendations
7. Systems shall not be installed where subject to UV exposure, including from interior lighting
8. Installers shall attend the Manufacturer's installation training class and shall include training certificate(s) with the piping material submittal

F. All valves in potable water systems shall be "lead-free" type.

G. All valves ¾" and smaller shall be "full-port" type, and greater than ¾" may be "reduced-port" type.

H. Gate valves (water entrances only) shall be constructed with a gray iron, non-rising stem, outside screw and yoke (OS&Y), full port. Stem to be adjustable graphite packing, ANSI 372 Lead Free, bronze mounted seat rings, solid wedge, back seat protection, with malleable iron handwheels. Valve shall meet MSS-SP70, Apollo Valves 611F or approved equals by Hammond/ Milwaukee, Nibco, or Stockham.

I. Ball valves:

1. Valves 2 inch and smaller shall be two-piece bronze body, full port with solid, smooth bore chrome plated brass ball, meeting MSS-SP110 and rated for no less than 300 psi. Seats shall be reinforced TFE with Teflon packing ring and threaded adjustable packing nut. Valves on insulated lines will be provided with stem extensions to provide clearance for two inches of pipe insulation. Valves to be Apollo Valves 77C, Hammond/Milwaukee UP8301, or Watts B-6080.

2. Ball valves used under the deductive alternate of PEX piping shall be compatible to the PEX piping, and meet the intent of the above.

J. Balancing valves:

1. Valves shall be NSF/ANSI 61/372 certified and suitable for potable water applications. Valve shall be suitable for the greater of 125 psig pressure and 40°F to 250°F temperature or the system's operating conditions. Valve shall provide positive shut-off and be rated for 300 psig. Each balancing valve shall be equipped with two gauge taps with check valves and drip caps. Balancing valves shall be Bell and Gossett Circuit-Setter Plus or equal by Nexus, FlowDesign, or Watts. Provide preformed insulation to encase valve assembly in insulated piping.

2. Valves up to 3" shall have lead-free brass body, full-port ball constructed of 304 stainless steel, and shall have calibrated nameplate with memory stop. Balancing valves shall be Bell and Gossett Circuit-Setter Plus or equal by Nexus, FlowDesign, or Watts. After the test and balance is complete, provide to the Owner a differential pressure gauge to match the balancing valves. Autoflow valves are acceptable as a substitution provided the flow cartridge is replaceable and the flowrate is clearly and permanently labeled.

3. Balancing valves used under the deductive alternate of PEX piping shall be compatible to the PEX piping, and meet the intent of the above.

K. Check valves:

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN
ISLANDS

DATE: 03.14.2025
DRAWN BY: A. COBB
CHECKED BY: C. LYLES
APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: P0.6

PLUMBING SPECIFICATIONS

PROFESSIONAL ENGINEER
CHRISTOPHER LYLES
1784-E
U.S. VIRGIN ISLANDS

1. Valves in water systems shall be NSF/ANSI 61/372 certified and suitable for potable water applications. Valve shall be swing-type, bronze body, brass seat, Apollo Valves 161S-LF up to 200 psi CWP, or equal by Milwaukee UP968 or Hammond.

2. Check valves used under the deductive alternate of PEX piping shall be compatible to the PEX piping, and meet the intent of the above.

3.

4. All check valves on pump discharges shall be non-slam type.

5. All check valves shall be installed in an orientation allowed by the manufacturer's recommendations.

6. All check valves installed in insulated piping systems shall have the check valve location explicitly labeled on the outside of the insulation.

L. Non-freeze wall hydrants (NFWH) shall be non-freeze, bronze box type with vacuum breaker, loose key and wall clamp. Finish shall be rough bronze subject to approval by the Architect. Wall hydrants shall be JR Smith 5509QT or approved equal by Josam, Watts, or Zurn.

M. Backflow preventer at water service entrance shall be Watts Series LF009 or LF909 reduced pressure zone (RPZ) principle backflow preventer complete with strainer and shut-off valves. RPZ air gap drain shall be sized for the larger of the manufacturer's recommendation or the requirements of the AHJ and shall be piped outside of building to a concrete splashblock unless otherwise indicated.

N. Water connections to appliances shall be made with flexible copper tubing or commercial grade double-reinforced stainless steel braided hose, no less than 3/8" in size, or the connections size of the appliance, whichever is greater.

O. Water heater mixing valve shall be sized by the Manufacturer for the fixture(s) served but shall be no less capacity than Leonard 210-LF or an approved equal with lead-free construction, vandal resistant adjustment cap, and integral inlet check valves. Special attention is called to minimum fixture hot water flow.

P. Point of use mixing valves shall be Leonard 170-LF or an approved equal with lead-free construction, vandal resistant adjustment cap, and integral inlet check valves. Mixing valve shall be ASSE 1070 rated. Mixing valve shall be sized by the Manufacturer for the fixture(s) served. Mixing valve shall have no more than 0.25 gpm minimum flowrate required.

Q. All water hammer arresters (WHA) shall be size A, B, C, D, E or F, as required for the fixture units served; Josam, JR Smith, Watts, or Zurn. WHAs shall conform to ASSE 1010. WHAs in potable water applications shall be lead-free.

R. The hose bibbs (HB) shall be complete with vacuum breaker and **vandal resistant** handle; Watts, Apollo Valves, JR Smith, or Zurn.

S. Soldered joints shall be made with tin-antimony/silver solder. Solder containing lead shall not be permitted.

T. Saddle valves and "T" fittings that rely on puncturing the piping main are disallowed.

U. Thermometers and pressure gauges shall be products of Trerice, Weksler, or Weiss. Select all devices to operate within 20% of the midpoint of their scales under normal operating conditions. Gauges provided on pumps shall be compound type.

V. Pressure and temperature (P&T) test plugs shall be constructed of brass with two (2) self-closing Nordel cores and be complete with cap and gasket. Plugs shall be as manufactured by Peterson or Lancaster. Provide a complete test kit to the Owner at the time of final inspection. Test kit shall be complete with pressure gauge, thermometer, probes and carrying case.

3.0 EXECUTION

3.17 ARRANGEMENT

A. Follow the general piping layout, arrangement, schematics and details. Provide all offsets, vents, drains and connections necessary to accomplish the installation. Fabricate piping accurately to measurements established at the project site to avoid interference with ductwork, other piping, equipment, openings, electrical conduits and light fixtures. Make suitable provision for expansion and contraction with expansion loops and offsets.

B. Water hammer arresters shall be installed at the top of each riser and on each fixture branch in accordance with Plumbing and Drainage Institute Standard WH201. WHAs shall also be installed at all water service to appliances with quick-closing valves, such as clothes washers, kitchen warewashers, icemakers, etc.

C. Cleanouts shall be provided at the base of all sanitary and storm risers and as required by code.

D. Fittings, unions, joints, couplings (including no-hub couplings), etc. shall not be within slabs.

E. All potable domestic water connections to equipment shall be provided with backflow prevention as required by the specification section and code.

F. Pressure gauges and thermometers called to be permanently installed shall be easily visible from a standing position on the ground.

3.18 UNDERGROUND WATER PIPING

A. All domestic water piping shall have a minimum cover of 3'-0", or below the frost line, whichever is deeper, except piping at least 20' from any exterior wall may be installed 3" or more below the bottom of the slab.

B. For water piping 2" and above, provide concrete thrust blocks at all changes of direction and secure all mechanical joints with restraining rods.

C. All copper water lines, or other material subject to corrosion, shall be protected from corrosion with a continuous plastic sheathing or coating and wrapping. This sheathing or coating and wrapping shall be extended 6" to 12" above finished floor. The protection shall be installed on the outside of any insulation required.

3.19 PIPE GROOVING AND INSPECTION

A. Grooved Pipe Joint Construction: Square cut pipe ends and roll groove ends of pipe in accordance to manufacturer's specifications. Gaskets shall be verified as suitable for the intended service and shall be coated on the lips with a thin uniform coat of lubricant in accordance with the manufacturer's published instructions. For installation-ready coupling, housing shall engage both grooves, otherwise the housing shall be assembled over the gasket and shall engage both grooves. The nuts shall be uniformly tightened until the housing pads are firmly together, metal to metal allowing visual inspection, or until properly tightened per manufacturer's specifications and instructions. A factory trained Representative shall provide on-site training for Contractor's field personnel in the use of grooving tools and installation of grooved joint products. The representative shall periodically visit the jobsite and ensure Contractor is following best recommended practices in grooved product installation including visual inspection of installation. A Distributor's Representative is not considered qualified to conduct the training or jobsite visit(s). To assure uniformity and compatibility of piping components in grooved end piping systems, all grooved products and grooving tools utilized shall be supplied by a single manufacturer with smart tools recommended. Groove depths shall be measured using a Victaulic Go-No-Go tape or 5200i tool to verify compliance with groove specifications.

3.20 DISINFECTION

A. All domestic water piping installed under this Division shall be disinfected with chlorine before it is placed into operation. The chlorinating material shall be liquid chlorine conforming to Federal Specification BB-C-120 and shall be introduced to the system by experienced operators only. The chlorine solution applied to the piping sections or system shall contain at least fifty parts per million of available chlorine and shall remain in the sections or system for a period of not less than sixteen (16) hours. During the disinfection period, all valves shall be opened and closed at least four times. After the disinfection period, the chlorinated water shall be flushed from the system with clear water until the residual chlorine content is not greater than two-tenths parts per million (0.2 PPM). Submit certification to the Architect that the system was disinfected.

END OF SECTION

SECTION 22 11 23
DOMESTIC WATER PACKAGED BOOSTER PUMPS

1.0 GENERAL

1.17 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 11 23 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction and installation of the packaged booster pumping system as specified herein and as shown. The system shall include, but is not limited to, the following; all factory-assembled as one complete assembly:
1. Duplex vertical end suction pumps
2. Control panel
3. Bladder surge tank
4. Piping, valves, wiring, etc.
5. Frame

C. System shall be NSF/ANSI 61/372 certified, suitable for potable water service, and shall be "lead-free".

1.18 BASIS OF DESIGN

A. The basis of design is as scheduled. Any proposed substitutions shall be proven equal in all respects to the equipment specified as the basis of design. Any modifications to piping, electrical work, controls, building structure, etc., that result from any substitution shall be coordinated with all trades. This coordination shall occur before delivery of equipment and any modifications shall be performed without incurring additions to the Contract.

1.19 ACCEPTABLE MANUFACTURERS

A. Acceptable substitute manufacturers are Bell & Gossett, Hyfab, Flo-Pak, and Syncro-Flo, provided that their pumps, accessories, performance, appearance and physical characteristics are equal in all respects to the basis of design for this specific project.

2.0 PRODUCTS

2.08 PUMPS

A. Provide duplex pumps with capacities as shown. Pumps shall be centrifugal type, flexible-coupled, for installation in vertical position, and capable of being serviced without disturbing piping connections. Pumps shall be appropriate for variable speed and include shaft grounding rings.

B. Pump casing shall be of cast iron or stainless steel. The impeller shall be of cast bronze, enclosed type, dynamically balanced and keyed to the shaft.

C. The liquid cavity shall be sealed off at the motor shaft by an internally-flushed mechanical seal. A bronze shaft sleeve shall completely cover the wetted area under the seal.

D. Pumps shall be rated for a minimum of 175 psi working pressure, or the working pressure where they are to be installed, whichever is greater. Each pump case shall have gauge tappings at the suction and discharge nozzles and shall include vent ports.

E. Motor shall have heavy-duty grease lubricated ball bearings, selected for the maximum load for which the pump is designed. The motor shall be NEMA standard design and must not use special bearings as a thrust handling method. The motor shall have a 1.15 service factor.

2.09 CONTROL PANEL

A. Control panel shall be a NEMA I enclosure complete with HOA switches, run lights, control transformer, magnetic starters with overload protection, single main disconnect switch, system pressure switch, low suction pressure shut off, minimum run timers for each pump, manual and automatic lead-lag alternator and lag pump start timer.

1. Main Control Panel: A door-operated non fused main disconnect shall be provided which shall remove power from the entire pressure booster when switched off. Each Variable Speed Drive (VFD)/Motor shall be protected by a molded case circuit breaker or MSP enclosed in the main control panel.
2. Motor Controller: NEMA ICS 7.1 variable-frequency, variable torque, solid-state pulse-width modulating type. VFD protective features shall include:
   a. Ground fault
   b. Short Circuit
   c. Motor overload
3. Suction and discharge pressure transducers.
   a. Pressure transducers shall be utilized for providing all pressure signals for the pump control logic. Pressure switches are not acceptable.
   b. Pressure transducer shall be a solid-state bonded strain gage type with an accuracy of plus/minus 1 %. Transducer shall be constructed of non-ferrous metal suitable for used with domestic water. Pressure transducers constructed of plastic are not acceptable.
   c. Transducer shall be rated for package discharge and suction pressures as shown on submittal.
   d. Pressure transducer shall be constructed to prevent moisture intrusion.
4. Controller: Touchscreen variable speed pump logic controller in a NEMA 1 enclosure with door operated disconnect to include, power distribution and overload protection for each AFD and the following control features:
   a. Unit shall utilize user-friendly front panel programming that displays parameters in clear text.
   b. Display shall show all system variables in plain English.
   c. Program settings shall be changeable and stored in non-volatile memory. Program settings shall be retained in memory in the event of loss of power to the controller, without the use of a backup battery.
   d. System operating pressure shall be clearly displayed in PSI or feet of head for ease of use and to provide an operator friendly interface.
   e. Additional parameters, where applicable, shall be displayed in units consistent with pumping systems.
   f. The settings and program in whole or part may be locked out with the use of an operator selectable password. Standard system settings shall include at a minimum the following functions:
      (a) Low suction pressure shutdown with auto restart
      (b) High discharge pressure shutdown with lockout
      (c) High discharge temperature shutdown
      (d) Pump failure alarm
      (e) Constant pressure setting with variable flow capability
      (f) Multiple pump operation with alternation
      (g) Pump starting point with allowable, adjustable pressure drop
      (h) Minimum speed
      (i) No flow standby

2.10 TANK

A. Furnish ASME stamped hydro-pneumatic bladder type tank for field installation. Tank shall be rated for the system pressure at the installation location. System shall have ASME relief valve, air charging valve, drain valve, and pressure gauge. Tank shall have a minimum capacity as indicated and be vertical type. Tank shall be installed thelocation as indicated on the plans or, where not indicated, recommended by the Manufacturer.

2.11 PIPING AND VALVES

A. Pressure gauges shall be mounted at the suction header and discharge header.

B. Piping shall be Type 304 stainless steel complete with two-piece, bronze body, full port ball shut-off valves at each pump suction and discharge.

C. Non-slam, spring loaded, silent check valves shall be provided at each pump discharge.

D. Self-contained thermal relief valves factory set to discharge at 125°F shall be mounted on each pump.

2.12 FRAME

A. Package Base: The pressure booster base shall be designed and fabricated to provide proper structural support for all attached equipment, and provide for anchorage to the structure. The base shall include a rigid structural member for pump and motor support. Main members shall be constructed from heavy weight structural steel members with reinforcing channels for larger boosters. Steel base shall be painted with machinery enamel and shall be suitable for grouting to a concrete housekeeping pad.

2.13 TESTING AND PACKAGING

A. Each system shall be factory tested by the Manufacturer in accordance with Hydraulic Institute Standards at a minimum of 350 psi, thoroughly cleaned, and painted with at least one coat of high-grade machinery enamel prior to shipment.

B. The entire system shall be factory assembled and shipped with all interconnecting piping and wiring complete and tested for proper operation. The only field connections required shall be:
1. Suction piping connection
2. Discharge piping connection
3. Drain pipe
4. One power connection at control panel

C. The booster system shall ship with four (4) certified copies of the shop test documenting the operation and capacity of the system as tested at the factory.

3.0 EXECUTION

3.21 INSTALLATION AND START-UP

A. The booster system shall be installed in strict accordance with ANSI/HI 1.4-2000, the manufacturer's recommendations, and the Contract Documents.

B. The frame shall be grouted level and secured to the housekeeping pad with anchor bolts.

C. Examine areas, equipment foundations, and conditions, for compliance with requirements for installation tolerances and other conditions affecting performance of pumps.

D. Examine rough in for piping systems to verify actual locations of piping connections prior to installation.

E. Examine equipment foundations and/or inertia bases for suitable conditions where pumps are to be installed.

F. Correct unsatisfactory conditions prior to installation of pumps. Install booster package in specified location.

G. Provide access for periodic maintenance, including removal of motors, impellers, and accessories.

H. Verify proper pump rotation at start-up.

I. Perform start-up procedures per manufacturer's instructions.

3.22 SEQUENCE OF OPERATION

A. The pump controller shall receive a 4-20mA signal from each pressure transducer.

B. The pressure transducer shall monitor system pressure and provide an analog signal to the pump control software, and allow the VFD motor controller to provide a variable Volts/Hz output to the motor.

C. Whenever the pressure drops below the set system pressure, the lead pump shall start and run at speed required to maintain system pressure setpoint (as set by the Operator). If the pressure setpoint cannot be maintained by one pump, the lag pump shall start to provide the extra flow and pressure automatically.

D. When demand decreases to a level which can be met by one pump and an adjustable minimum run-timer has elapsed, the lag pump will be stopped.

E. The lead pump shall alternate based on elapsed run time.

F. When the system experiences low demand the controller shall test for a no flow condition without the use of external switches or controls. The controller will stop the lead pump after verifying a zero demand condition exists and a minimum run-timer has elapsed. The hydro-pneumatic tank shall supply water to the system until the pressure falls below the restart pressure, at which point the lead pump shall restart.

G. All program settings shall be based on centrifugal pump language.

H. Program settings shall be password protected. With proper password entry, settings shall be field adjustable to allow changes by the User.

END OF SECTION

SECTION 22 30 00

PLUMBING EQUIPMENT

1.0 GENERAL

1.20 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 30 00 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the water heating systems as specified herein and as shown. These systems include, but are not limited to, the following:
1. Water Heaters
2. Hot Water Circulator

1.21 GENERAL REQUIREMENTS

A. All plumbing equipment installed in locations with a water hardness of 25 grains per gallon or more, shall be resistant to corrosion. Where copper materials are in the water stream, it shall be Cupro-Nickel of not more than 90% copper.

B. All water heaters shall be NSF/ANSI 61 certified "lead free" for potable water service.

C. All water heaters shall have ASME rated temperature and pressure relief valve(s). Valve(s) shall be provided by the Manufacturer and sized for the discharge location noted in the plans.

D. All water heaters and tanks shall be glass-lined, 1600°F fired, with a working pressure of 150 psi, a test pressure of 300 psi, or the system pressure at the installation location, whichever is greater, and shall have magnesium anodes for electrolytic protection. Separate storage tanks may also be cement-lined. Tanks shall be ASTM stamped.

E. All water heaters shall meet or exceed the energy efficiency requirements of the latest version of ASHRAE 90.1.

F. All water heaters and pumps shall be UL approved and labeled, and be AGA certified where applicable.

G. All water heaters and pumps shall be NEMA rated appropriate for the installation location in which they are installed.

H. Water heater controls shall include an operating thermostat and manual reset high limit control for each heating element or burner. The safety high limit control shall prevent over heating in the event of a thermostat failure.

I. All controls shall be factory-wired and require no external power source.

J. Water heaters and tanks shall have drain with external access and hose end connection.

2.0 PRODUCTS

2.14 INSTANTANEOUS WATER HEATER SMALL ELECTRIC

A. The instantaneous water heaters shall be as scheduled. Acceptable substitute manufacturers are (electric) Stiebel Eltron and Chronomite and (gas), AO Smith, Rinnai, Lochinvar, and Noritz, subject to substitution requirements.

B. The heater shall be fitted with an electronic, solid state temperature control system adjustable from 100°F to 140°F; set at 105°F.

C. The heating and control system shall be enclosed in an impact resistant and shockproof case of Cycolac KJW flame-retardant thermoplastic.

D. The water heaters shall be UL approved and labeled without the need for a T&P relief valve, or a T&P valve shall be provided and installed.

2.15 WATER HEATER COMMERCIAL ELECTRIC

A. The water heater shall be as scheduled. Acceptable substitute manufacturers are AO Smith, Lochinvar, State, Rheem, and Bradford White, subject to substitution requirements. Water heaters shall be commercial-grade.

B. The immersion heating elements shall be low watt density with a plated incoloy sheath material for long life. The heating elements shall mount in individual screw-in tank flanges.

C. All field electrical wiring connections to the water heater shall be made to a main terminal block. All internal wiring shall be made to solderless terminal lug wiring connections. Wiring to be color coded for ease of servicing. The water heater shall be factory assembled, wired and tested.

2.16 MINI-TANK WATER HEATERS

A. The water heater shall be as scheduled. Acceptable substitute manufacturers are Stiebel Eltron, Chronomite, and AO Smith, subject to substitution requirements.

B. Water heaters shall have a minimum tank capacity of 2 gallons, unless otherwise scheduled.

2.17 HOT WATER CIRCULATOR

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE: 03.14.2025
DRAWN BY: A. COBB
CHECKED BY: C. LYLES
APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: P0.7

PLUMBING SPECIFICATIONS

PROFESSIONAL ENGINEER
CHRISTOPHER LYLES
1784-E
U.S. VIRGIN ISLANDS

A. Hot water circulator shall be as scheduled. Acceptable substitute manufacturers are B&G, Goulds, and Grundfos, subject to substitution requirements.

B. Hot water circulators used in potable water system shall be lead-free.

3.0 EXECUTION

3.23 INSTALLATION

A. The water heaters and accessories shall be installed in strict accordance with the manufacturer's recommendations and the Contract Documents.

B. All temperature and pressure relief valves shall be piped full size to an indirect waste such as the nearest floor drain, service sink, sink tailpiece, etc. Piping shall be in accordance with specification 22 10 00 for DWV services. Size shall be in accordance with manufacturer's requirements.

C. All water heaters shall have internal heat traps or shall have heat traps installed in the cold water and hot water piping. Instantaneous water heaters shall be provided with heat traps unless manufacturer documentation specifically allows exclusion.

D. Water heaters shall be completely encased in high density insulation of sufficient value to meet the energy efficiency standards of latest version of ASHRAE 90.1, or shall be factory insulated with non-CFC polyurethane closed-cell foam insulation. Provide removable insulation panels to maintain access to all required components.

E. All water heaters or boilers subject to condensing under normal steady-state operating conditions shall be provided and installed with accessory condensate neutralization kits.

F. Specific attention is called to confirm minimum instantaneous water heater flowrate does not exceed minimum fixture use flowrate.

3.24 WARRANTY

A. Provide 5-year limited warranty on all tanks and heat exchangers, and 1-year limited warranty on parts unless otherwise noted.

END OF SECTION

SECTION 22 40 00
PLUMBING FIXTURES

1.0 GENERAL

1.22 DESCRIPTION

A. All work specified in this section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 40 00 and the accompanying drawings cover the provisions of all labor, fixtures, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the plumbing fixtures and trim as specified herein and as shown.

C. All finishes shall be as selected by the Architect. Where the Architect does not have a preference, finishes shall be in accordance with this specification.

D. All exposed piping, valves, stops, P-traps, etc. shall be chrome-plated. Also, all exposed piping penetrations through walls, floors or ceilings shall be provided with chrome-plated cast brass escutcheons.

E. All P-traps shall be minimum 17-gauge brass.

F. All exposed P-traps subject to contact, such as those below wall-mounted or counter-mounted lavatories, shall be provided with insulated covers as required.

G. All exposed supply stops for hot water, such as those below wall-mounted or counter-mounted lavatories, shall be provided with insulated covers as required. Where there are hot and cold water supply stops together, cold water supply supply stops shall match insulated cover of hot water supply stop.

H. Flush valves shall have non-hold open feature, vacuum breakers and cover cap on angle-type stop.

I. Provide all final connections to all equipment and fixtures furnished by Owner.

J. Unless otherwise specified in an individual fixture description, all enameled cast-iron and porcelain fixtures shall be white.

1.23 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted, clean plumbing fixtures as shown and specified, which are free of leaks, noise, air, vibration and waterflow fluctuations.

1.24 BASIS OF DESIGN

A. The basis of design is as outlined for each fixture in the 2.0 PRODUCTS subsection. Any proposed substitutions shall be proven equal in all respects to the equipment specified as the basis of design.

1.25 ACCEPTABLE MANUFACTURERS

A. Acceptable fixture manufacturers for each type of fixture is as follows:
1. Water Closets - American Standard, Kohler, Sloan, TOTO, and Zurn
2. Urinals - American Standard, Kohler, Sloan, TOTO, and Zurn
3. Lavatories - American Standard, Bradley, Crane, Kohler, Sloan, TOTO, and Zurn.
4. Lavatory Faucets - American Standard, Bradley, Chicago, Delany, Grohe, Kohler, Sloan, TOTO, and Zurn
5. Breakroom/Kitchen/Pantry/Etc. Sinks - American Standard, Elkay, Grohe, Just, and Kohler
6. Breakroom/Kitchen/Pantry/Etc. Faucets - American Standard, Chicago, Delta, Elkay, Just, Kohler, and Zurn
7. Water Coolers and Water Fountains - Acorn, Elkay, Halsey Taylor, and Oasis
8. Service and Laundry Sinks - Fiat, Kohler, Mustee, ProFlo, and Stern-Williams
9. Service and Laundry Faucets - American Standard, Delta, Elkay, Fiat, Kohler, T&S Brass, Speakman, and Stern-Williams
10. Shower Stalls - American Standard, Aquatic Bath, Freedom, and Kohler
11. Shower Fittings - Acorn, American Standard, Bradley, Chicago, Delta, Kohler, Speakman, and Zurn
12. Emergency Shower and Eyewash - Acorn, Bradley, and Guardian

2.0 PRODUCTS

2.18 REFER TO SCHEDULE ON SHEET P0.1

3.0 EXECUTION

3.25 INSTALLATION

A. Units shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual units to be provided with all trades.

B. All plumbing fixtures shall be free of leaks, provided completely finished, trimmed, adjusted, cleaned and ready for use. They shall be properly secured to the structure by the use of thru-bolting, backplates, carriers, expansion shields (for floor mounting only) or toggle bolts.

C. Wall hung fixtures supported on chair carriers shall be bolted to the floor slab. Carefully coordinate space requirements and fixture mounting height requirements with supports being furnished.

D. Fixtures supported with wall hangers on masonry chase walls shall be fastened to the wall with not less than 3/8" bolts which shall pass through the wall and through a 1/4" x 4" wide steel backplate on the unfinished chase wall side.

E. Where fixtures are hung on single masonry walls without a pipe chase behind, they shall be mounted with 3/8" toggle bolts.

F. Fixtures on steel stud walls shall have a 1/4" x 4" wide steel backplate wired with 1/16" steel wire to the studs. Bolts not less than 3/8" shall secure the fixtures through the fixture hanger and the backplate.

G. All mounting holes provided in fixtures shall be used for support. In addition to the main hangers, 1/4" toggle bolts shall secure the bottom of all wall hung fixtures at each drilling provided for this purpose.

H. Mount wall-hung fixtures at the heights indicated on the Architectural Drawings or as prescribed by local code. Special attention is called to the installation requirements of the ANSI Handicap Code.

3.26 CLEANING AND ADJUSTMENT

A. The units shall be cleaned, tested and field-adjusted to provide optimum flow and drainage. Specific attention is called to adjustment of automatic flush valves and faucets for empirical conditions.

B. All flush valves, diaphragms, strainers, aerators, etc. shall be fully cleaned after all piping and fixture flushing.

END OF SECTION

END OF SPECIFICATIONS

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION

CONSULTANTS

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BW&A Job No. 2024-1102

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE: 03.14.2025
DRAWN BY: A. COBB
CHECKED BY: C. LYLES
APPROVED BY: C. LYLES

PROJECT NO.: 23-005.D
CONTRACT NO.: -

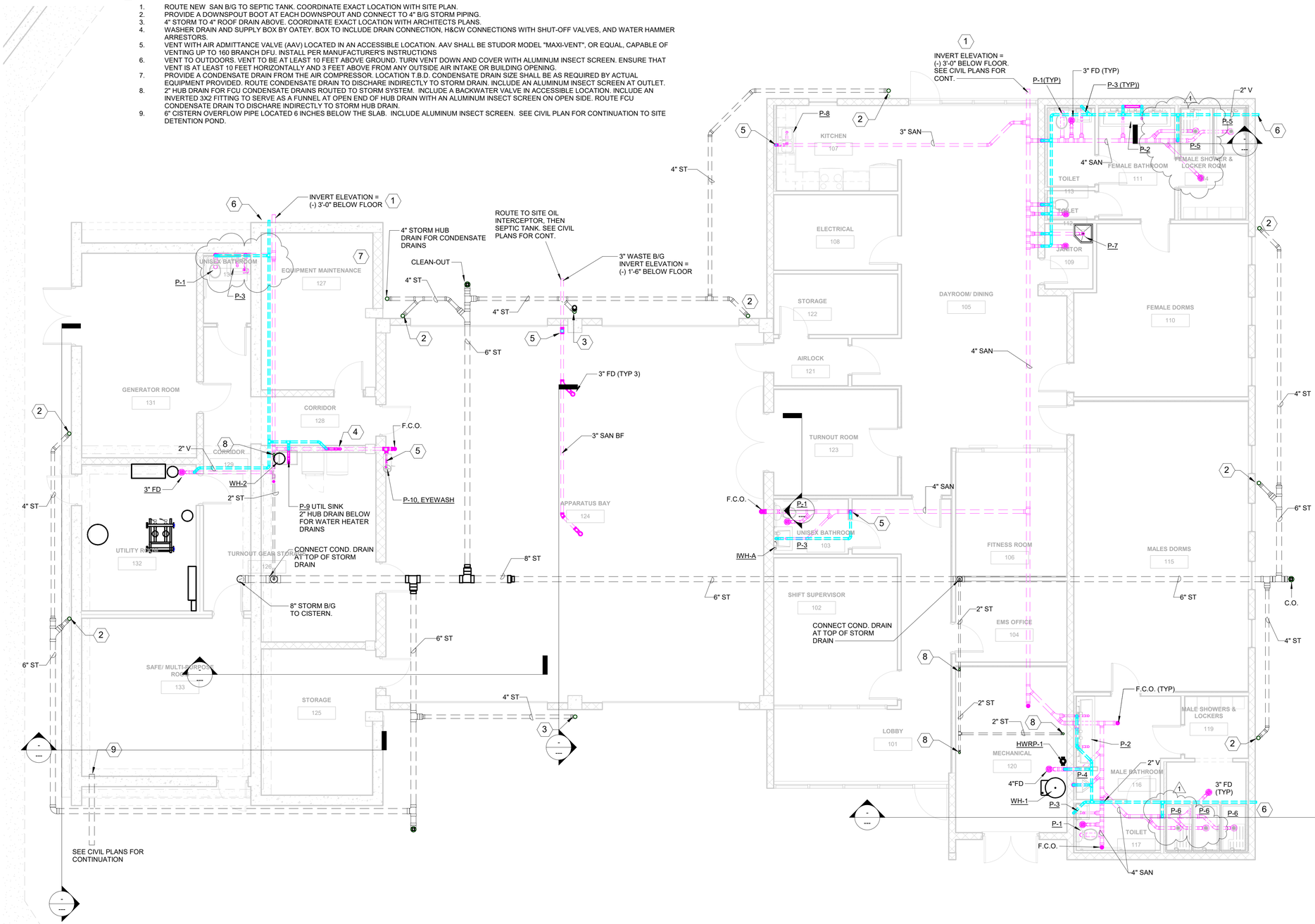
SHEET NO.: P0.8

PLUMBING SPECIFICATIONS

PROFESSIONAL ENGINEER
CHRISTOPHER LYLES
1784-E
U.S. VIRGIN ISLANDS

KEYNOTES (APPLY TO THIS SHEET ONLY):

1. ROUTE NEW SAN B/G TO SEPTIC TANK. COORDINATE EXACT LOCATION WITH SITE PLAN.
2. PROVIDE A DOWNSPOUT BOOT AT EACH DOWNSPOUT AND CONNECT TO 4" B/G STORM PIPING.
3. 4" STORM TO 4" ROOF DRAIN ABOVE. COORDINATE EXACT LOCATION WITH ARCHITECTS PLANS.
4. WASHER DRAIN AND SUPPLY BOX BY OATEY. BOX TO INCLUDE DRAIN CONNECTION, H&CW CONNECTIONS WITH SHUT-OFF VALVES, AND WATER HAMMER ARRESTORS.
5. VENT WITH AIR ADMITTANCE VALVE (AAV) LOCATED IN AN ACCESSIBLE LOCATION. AAV SHALL BE STUDOR MODEL "MAXI-VENT", OR EQUAL, CAPABLE OF VENTING UP TO 160 BRANCH DFU. INSTALL PER MANUFACTURER'S INSTRUCTIONS
6. VENT TO OUTDOORS. VENT TO BE AT LEAST 10 FEET ABOVE GROUND. TURN VENT DOWN AND COVER WITH ALUMINUM INSECT SCREEN. ENSURE THAT VENT IS AT LEAST 10 FEET HORIZONTALLY AND 3 FEET ABOVE FROM ANY OUTSIDE AIR INTAKE OR BUILDING OPENING.
7. PROVIDE A CONDENSATE DRAIN FROM THE AIR COMPRESSOR. LOCATION T.B.D. CONDENSATE DRAIN SIZE SHALL BE AS REQUIRED BY ACTUAL EQUIPMENT PROVIDED. ROUTE CONDENSATE DRAIN TO DISCHARE INDIRECTLY TO STORM DRAIN. INCLUDE AN ALUMINUM INSECT SCREEN AT OUTLET.
8. 2" HUB DRAIN FOR FCU CONDENSATE DRAINS ROUTED TO STORM SYSTEM. INCLUDE A BACKWATER VALVE IN ACCESSIBLE LOCATION. INCLUDE AN INVERTED 3X2 FITTING TO SERVE AS A FUNNEL AT OPEN END OF HUB DRAIN WITH AN ALUMINUM INSECT SCREEN ON OPEN SIDE. ROUTE FCU CONDENSATE DRAIN TO DISCHARE INDIRECTLY TO STORM HUB DRAIN.
9. 6" CISTERN OVERFLOW PIPE LOCATED 6 INCHES BELOW THE SLAB. INCLUDE ALUMINUM INSECT SCREEN. SEE CIVIL PLAN FOR CONTINUATION TO SITE DETENTION POND.



1 P1.0 PLUMBING PLAN - SAN/W/V/STORM
3/16" = 1'-0"

REVISIONS

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1	09/05/2025	REV 1

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NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

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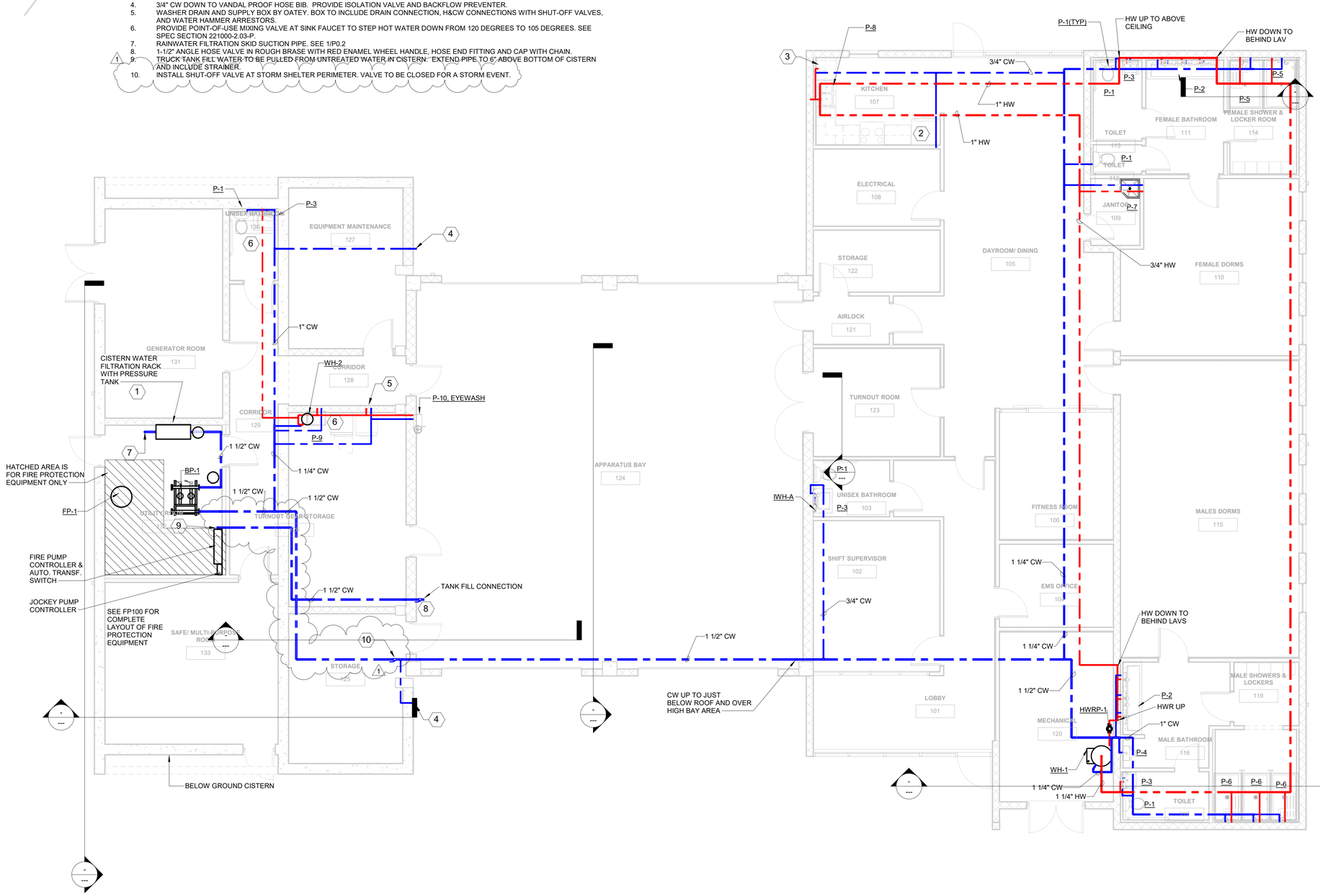
SHEET NO.: P1.0

PLUMBING PLAN - SAN/W/V

PROFESSIONAL ENGINEER
CHRISTOPHER LYLES
1781-E
U.S. VIRGIN ISLANDS

KEYNOTES (APPLY TO THIS SHEET ONLY): (#)

1. REFER TO DETAILS ON P0.4 FOR CISTERN PUMP, PRESSURE TANK & FILTRATION RACK PIPING CONFIGURATION.
2. PROVIDE 1/2" VALVED CW STUB WITH DUAL CHECK BACKFLOW PREVENTER FOR CONNECTION TO REFRIGERATOR ICE MAKER WALL SUPPLY BOX.
3. PROVIDE 1/2" VALVED HW STUB FOR CONNECTION TO DISHWASHER. ROUTE DRAIN PIPING TO APPROVED AIR GAP FITTING ON SINK TAILPIECE.
4. 3/4" CW DOWN TO VANDAL PROOF HOSE BIB. PROVIDE ISOLATION VALVE AND BACKFLOW PREVENTER.
5. WASHER DRAIN AND SUPPLY BOX BY OATEY. BOX TO INCLUDE DRAIN CONNECTION, H&CW CONNECTIONS WITH SHUT-OFF VALVES, AND WATER HAMMER ARRESTORS.
6. PROVIDE POINT-OF-USE MIXING VALVE AT SINK FAUCET TO STEP HOT WATER DOWN FROM 120 DEGREES TO 105 DEGREES. SEE SPEC SECTION 221000-2.03-P.
7. RAINWATER FILTRATION SKID SUCTION PIPE. SEE 1/P0.2
8. 1-1/2" ANGLE HOSE VALVE IN ROUGH BRASE WITH RED ENAMEL WHEEL HANDLE, HOSE END FITTING AND CAP WITH CHAIN.
9. TRUCK TANK FILL WATER TO BE PULLED FROM UNTREATED WATER IN CISTERN. EXTEND PIPE TO 6" ABOVE BOTTOM OF CISTERN AND INCLUDE STRAINER.
10. INSTALL SHUT-OFF VALVE AT STORM SHELTER PERIMETER. VALVE TO BE CLOSED FOR A STORM EVENT.



1 P1.1 PLUMBING PLAN - WATER
3/16" = 1'-0"

REVISIONS

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ESTATE FORTUNA (TANGO CO.) FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

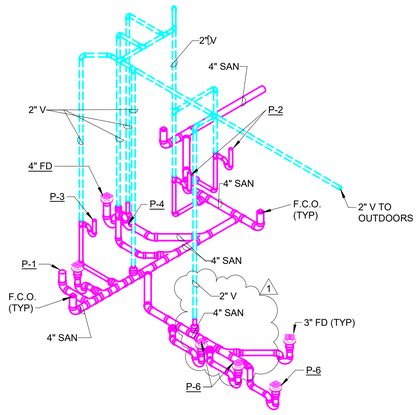
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PROJECT NO.: 23-005.D
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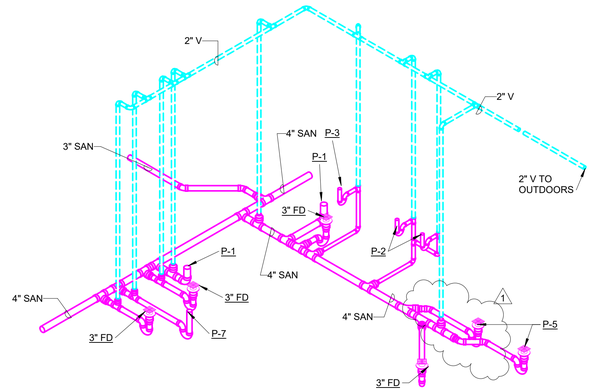
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PLUMBING PLAN - WATER

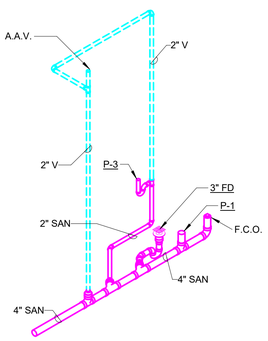
PROFESSIONAL ENGINEER
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17841-E
U.S. VIRGIN ISLANDS



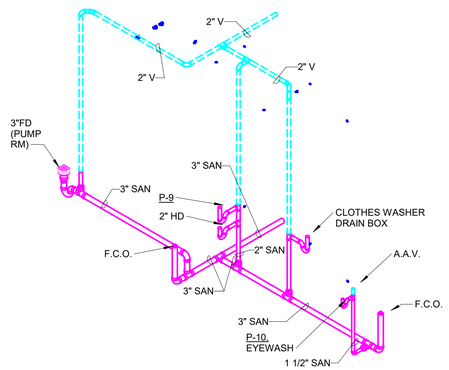
1 P2.1 PLUMBING RISER DIAGRAMS - SAN/W/VENT/STORM - MEN'S BATHROOM



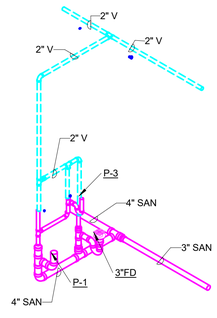
2 P2.1 PLUMBING RISER DIAGRAMS - SAN/W/VENT/STORM -WOMEN'S BATHROOM



3 P2.1 PLUMBING RISER DIAGRAMS - SAN/W/VENT/STORM - UNISEX RESTROOM 103



4 P2.1 PLUMBING RISER DIAGRAMS - SAN/W/VENT/STORM -LAUNDRY



5 P2.1 PLUMBING RISER DIAGRAMS - SAN/W/VENT/STORM -UNISEX RESTROOM 130

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN
ISLANDS

DATE: 03.14.2025

DRAWN BY: A. COBB

CHECKED BY: C. LYLES

APPROVED BY: C. LYLES

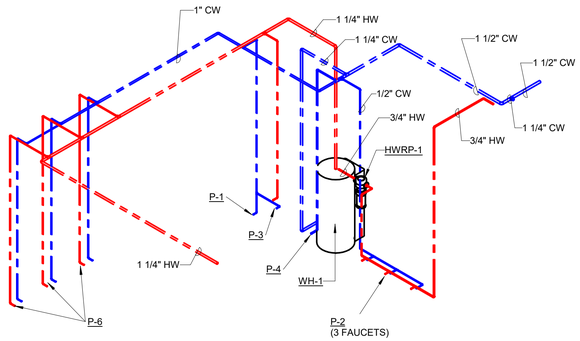
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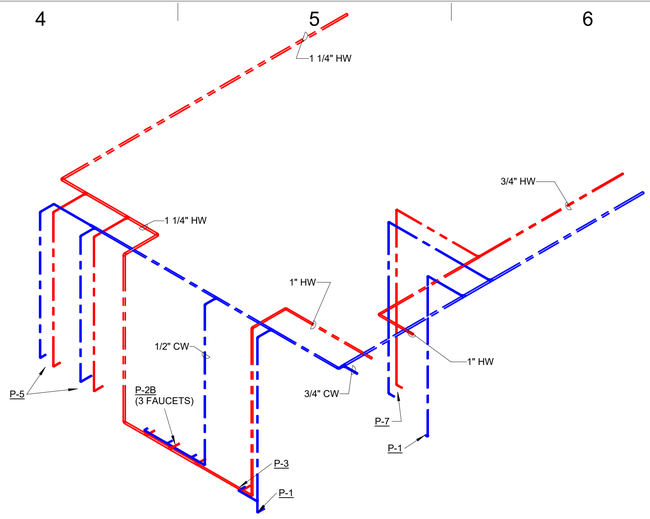
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PLUMBING RISER DIAGRAMS - S/W/V

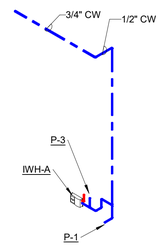
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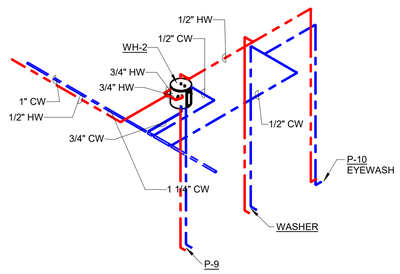
1 P2.2 PLUMBING RISER DIAGRAMS - WATER - MEN'S BATHROOM



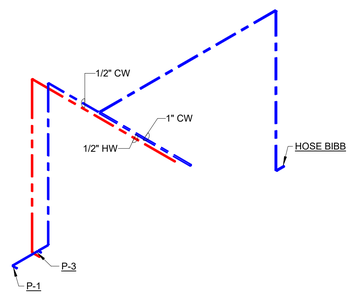
2 P2.2 PLUMBING RISER DIAGRAMS - WATER - WOMEN'S BATHROOM



3 P2.2 PLUMBING RISER DIAGRAMS - WATER - UNISEX RESTROOM 103



4 P2.2 PLUMBING RISER DIAGRAMS - WATER - LAUNDRY



5 P2.2 PLUMBING RISER DIAGRAMS - WATER - UNISEX RESTROOM 130

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FIRE STATION

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WEST END
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ISLANDS

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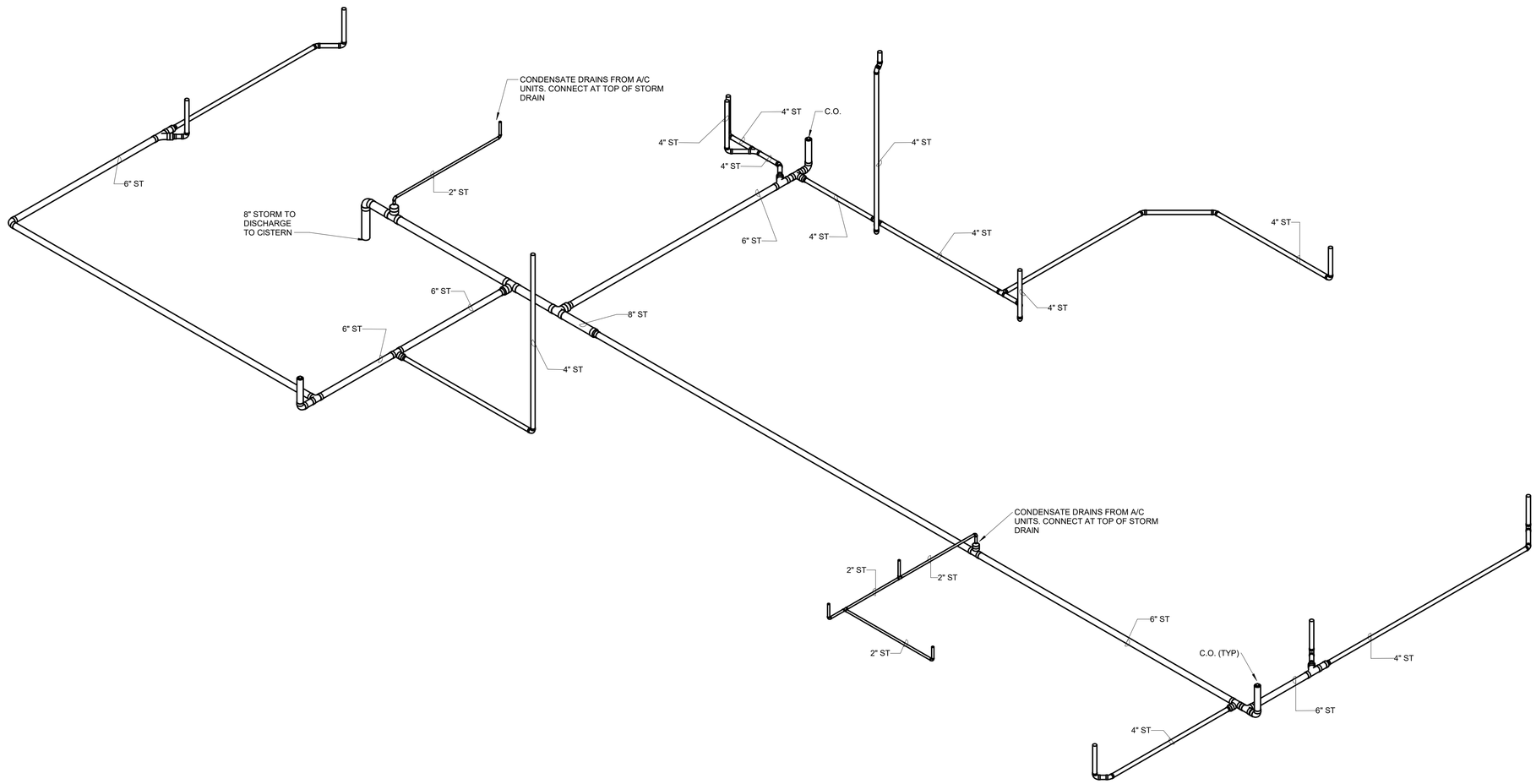
PROJECT NO.: 23-005.D

CONTRACT NO.: -

SHEET NO.: P2.2

PLUMBING RISER DIAGRAMS - WATER

PROFESSIONAL ENGINEER
CHRISTOPHER LYLES
1784-E
U.S. VIRGIN ISLANDS



1 P2.3 PLUMBING RISER DIAGRAMS - STORM

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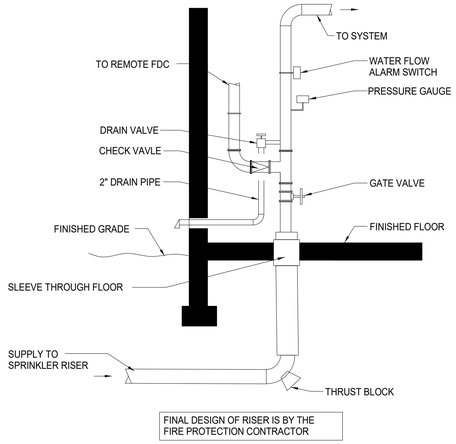
PROJECT NO.: 23-005.D

CONTRACT NO.: -

SHEET NO.: P2.3

PLUMBING RISER DIAGRAM - STORM

PROFESSIONAL ENGINEER
CHRISTOPHER LYLES
1784-E
U.S. VIRGIN ISLANDS



1 / FP0.1 FIRE RISER
12" = 1'-0"

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DRAWN BY: Author
CHECKED BY: Checker
APPROVED BY: Approver

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: FP0.1

FIRE PROTECTION DETAILS

SECTION 21 05 00
COMMON WORK RESULTS FOR FIRE SUPPRESSION

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 21 05 00 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the engineering, design and construction of the fire suppression systems as specified herein and as shown.

C. Attention is called to the different hazards, classes and types of fire suppression systems required within the facility. Systems shall include, but not be limited to the following:
1. Light hazard
2. Ordinary hazard

D. Coordinate the Seismic Design Category with the Structural and Civil Engineers. Provide and install seismic supports are required.

E. The work included under this Section 21 05 00 shall include, but is not limited to, the following:
1. Risers including all check valves, indicator valves, alarms, etc.
2. Siamese connections
3. Piping and sprinkler heads
4. Hydraulic design computations
5. Shop drawings and procurement of all approvals

1.02 STANDARDS AND APPROVALS

A. The sprinkler systems shall be designed and installed in conformance with the applicable standards of NFPA 13, NFPA 13R, NFPA 14, NFPA 22, NFPA 24, NFPA 72, Underwriters Laboratories (UL), the standards of the Underwriter (IRI/FM/ISO) and local codes.

B. The hydraulic calculations and sprinkler system design, products, materials, and installation shop drawings shall be submitted and approved by the Authority Having Jurisdiction, Owner's Insurance Underwriter, and the Fire Marshal.

C. The sprinkler systems shall be designed and installed by a firm which is duly licensed to install such systems in the Territory of the United States Virigin Islands, and carries a current certificate from the local Authority Having Jurisdiction (AHJ). This specification section and any Fire Protection plans provided are for performance, material, and design intent requirements only. All aspects of the scope shall ultimately be the responsibility of the Designer and Installer.

1.03 RECORD DRAWINGS

A. Upon completion of the work, provide record as-built documentation of the fire protection systems as actually installed to the Owner. Drawings shall be to scale and shall include all details required to accurately indicate the system as installed. Record drawings shall be produced in electronic format compatible with AUTOCAD. Furnish electronic copies of all drawings in dwg. format, and two (2) bond copies of all drawing sheets.

1.04 IDENTIFICATION

A. All control, check, drain, test and alarm valves and alarms shall be provided with identification signs of the standard design as adopted by the sprinkler industry and as recommended for the particular services. The signs shall be securely attached to each piece of equipment.

1.05 HOSE THREADS

A. Hose threads shall conform to the standards of the local Fire Department. The exact threads used shall be verified with the Fire Department before ordering materials.

1.06 FIRESTOPS

A. Where piping, conduit, etc. pass through fire partitions, fire walls and floors, a firestop shall be provided that will ensure an effective barrier against the spread of fire, smoke and gases. Firestop material shall be packed tight and completely fill gaps between the ductwork, piping, conduit, etc. and the perimeter of their rough openings.

B. All penetrations shall be in accordance with UL 1479 or ASTM E 814 listed systems, and products used shall be specifically applicable for the appropriate installation conditions. Assemblies shall provide a minimum rating equal to the construction penetrated. Products shall be by HILTI, 3M, or ProSet.

C. Installation shall be by a Qualified Installer. Installer shall be certified, licensed, or otherwise qualified by the Firestopping Manufacturer as having the necessary training to install the Manufacturer's specific product. A Manufacturer or Vendor's willingness to sell the firestopping product to the Contractor or Installer does not in itself confer qualification.

D. Installer shall have at least one of the following qualifications:
1. FM 4991 Approved Contractor
2. UL Approved Contractor
3. HILTI, 3M, or ProSet Accredited Fire Stop Specialty Contractor

E. Installing Firm shall have no less than 3 years of experience with firestop installation.

F. A Manufacturer's direct Representative (not Distributor or Agent) shall be on site during initial installation of firestop systems to train appropriate Contractor personnel in proper selection and installation procedures.

G. The Firestop Contractor or Installer shall supply As-Built documentation of each individual penetration location on the project. Documentation shall include a sequential location number, detailed description of the penetration location, size, and type, tested system number, type of assembly penetrated, and rating to be achieved. As-Built documentation shall be included with the close-out materials.

H. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach label permanently on both sides of penetrated construction in a visible location. The label shall include the following:
1. The words "Warning - Through Penetration Firestop System-Do Not Disturb"
2. Through Penetration firestop system designation and Manufacturer
3. Date of Installation

2.0 PRODUCTS

2.01 MINIMUM QUALITY LEVEL

A. All equipment and materials provided under this Section 21 05 00 shall be new and of the best grade commercial quality, shall be of the latest design of the Manufacturer, and shall be listed and approved by UL and the Underwriter. Materials and equipment manufactured outside of the United States will not be acceptable. All components shall be suitable for the pressures indicated on the flow test.

2.02 VALVES

A. All fittings shall be products of a domestic Manufacturer and made in the USA.

B. Materials shall be as follows:
1. Valves 2" and smaller: Bronze body
2. Valves over 2": Iron body with bronze trim

C. Connections shall be as follows:
1. Valves 4" and smaller: Threaded or flanged
2. Valves over 4": Flanged

D. Gate valves shall be double seat; type as follows:
1. Valves 2" and smaller: Rising stem type, except where space requires non-rising stem, solid wedge with union bonnet and replaceable seat rings
2. Valves over 2": Outside screw and yoke type with solid wedge and replaceable seat rings

E. Butterfly valves shall have bronze or ductile iron discs, stainless steel shaft and lock bolts, Buna N liner and as follows:
1. Valves through 6": Full lug type with wheel operators
2. Valves over 6": Full lug type, gear operators

F. Fire Department Connections (FDC) shall be 2 1/2" screwed, UL approved, brass hose valves for working pressure of 175 psig with 2 1/2" male hose threads, 1 1/2" removable reducer, polished brass cap and chain. FDC shall be sized per applicable NFPA. Contractor shall confirm this meets the local Fire Department requirements. Labeling shall be in accordance with local Fire Department requirements.

G. Provide and install Test Headers of quantity, location, and type as required by the local Fire Department and AHJ.

H. Swing checks shall be gravity operated with renewable composition discs. Wafer checks shall have renewable clapper facings and non-stick coated clappers, valve shall be approved for both horizontal and vertical installation.

I. All valves shall comply with requirements of NFPA and shall be Underwriters' Laboratories, Inc. (UL) listed.

J. Working pressure of all valves shall be minimum 175 psig at 70°F water temperature.

K. All valves utilized for shut-off service shall be lockable in the open position.

L. Alarm valves shall have electrical circuit closers.

2.03 DRAINS

A. Drains shall be provided in all risers and auxiliary drains at all low points in the system. Inspector's test drains shall be installed on each sprinkler system.

B. Pipe the main drain and test lines full size to the outside. Do not spill on walkways. Branch drain lines that are expected to be seldom used may be provided with standard size hose end connections if allowed by the local Fire Department and the AHJ.

C. Pipe small drips and drains to the outside of the building or to an indirect drain within the building.

2.04 WATER FLOW SWITCHES

A. Water flow switches with normally closed electrical contacts shall be provided in all required locations to open the electrical contacts at any time water flows in the associated riser or zone piping system.

2.05 TAMPER SWITCHES

A. Tamper switches with normally closed electrical contacts shall be provided in all required locations to open the electrical contacts at any time the associated valve is not fully open.

2.06 ALARM SYSTEM

A. Provide interlocks to the building fire alarm system to provide automatic signaling to an approved remote location with adequate dialing and communication system to alert the local fire department. Connection and leased line shall be provided by Owner.

2.07 SPRINKLER HEADS

A. All sprinkler heads shall be automatic, closed-type, quick-response, standard spray heads.

B. Sprinkler Heads in Ceilings

1. All areas with suspended ceilings, except specialty ceilings, shall have heads equal to Reliable Model G, semi-recessed type. Finish shall be as selected by the Architect.

2. All hard and specialty ceiling areas, including metal panel and plank ceilings, shall be provided with concealed, fully recessed heads. Cover finish shall be as selected by the Architect. Finish shall be by the Manufacturer and be incorporated in the manufacturing facility.

C. Sprinkler heads installed in storage, utility, mechanical equipment rooms and similar "back-of-house" areas without ceilings shall be bronze heads in the upright position unless otherwise noted.

D. The temperature rating of the sprinkler heads shall be in accordance with applicable code and the recommendations of the Underwriter. Specific attention is called to sprinkler heads within cooking areas, generator rooms, or other areas with temperature levels over 120°F expected.

E. Sprinkler guards shall be provided for all heads within seven feet of the floor, in mechanical, electrical and storage rooms, and elsewhere as required by the Underwriter.

F. Provide to the Owner a cabinet containing two (2) head wrenches and a minimum of six (6) spare heads of each type and temperature rating used in the systems.

G. All heads installed in areas with tile ceilings shall have the heads centered in the tile.

2.08 PIPING

A. All piping shall be products of a domestic Manufacturer and made in the USA.

B. Piping shall be Schedule 40, grade A53 or A120; except that Schedule 10 piping is acceptable on pipe sizes 2 1/2" and larger where permitted by the AHJ and applicable codes and standards. Schedule 10 piping shall not be threaded in the field, nor shall be cut-grooved in the field or by a Manufacturer. Couplings and fittings shall be threaded or grooved, Viking, Victaulic, or approved equal.

C. The use of light-wall threaded pipe such as Allied XL is prohibited.

D. When specifically approved by the Engineer and allowed by the Fire Marshal, and AHJ, piping and fittings shall be CPVC and comply with NFPA 13R, 13D, and 13. Piping shall be Schedule 40 up to 12", UL Listed and FM Approved for fire protection use, and shall comply with ASTM F 442. CPVC piping and fittings in return air plenums shall be ICC certified. When CPVC materials are used, the Construction Team shall be responsible for the compliance with all compatibility issues. CPVC fittings shall be UL Listed and FM Approved and joined in accordance with the listings of the pipe and fittings. Cure times shall be in accordance with manufacturer's recommendations but not less than 24 hours. CPVC piping shall only be used in system locations that do not exceed its listed maximum pressure and temperature.

1. Any piping or fittings that contacts non-compatible materials shall be replaced with new.

2. Manufacturer's material compatibility requirements or recommendations shall be posted on CPVC products in not less than 100' intervals during construction. In addition, Manufacturer's compatibility requirements shall be permanently posted in the fire service entrance, backflow preventer location, and all mechanical and utility rooms or closets as applicable, and at any transition from metal to CPVC piping. Coordinate postings with Owner.

E. At the Contractor's option, individual drops to sprinkler heads may be flexible corrugated stainless steel hose with stainless steel braid, approved by both Factory Mutual and UL. Flexible hose shall be secured above the ceiling with galvanized sheetmetal brackets and clamps. Flexible hose, brackets and clamp shall be as manufactured by Flexhead Industries, Inc. or an approved equal.

F. Underground sprinkler entrance piping shall be Class 150 ductile iron pipe with mechanical joints. Underground piping shall have thrust blocks at changes in direction.

2.09 PIPE HANGERS AND SUPPORTS

A. Provide all necessary hangers, supports, bracing, accessories, etc., as required for proper installation of the work, and only approved type hangers shall be used. All sprinkler piping shall be supported from building structure; sprinkler lines under ducts shall not be supported from ductwork but shall be supported from building structure with trapeze hangers where necessary.

B. Sprinkler piping 4" and larger shall have lateral supports at all elbows and changes of direction. Lateral supports shall be capable of restraining the pipe due to thermal expansion and the hydraulic forces of design water flow.

C. At a minimum, sprinkler piping supports shall be at intervals defined by code.

D. Piping supported from floors shall be provided with steel support bases.

2.10 ESCUTCHEONS

A. Each penetration through walls and ceilings shall be equipped with a escutcheon, finish to be selected by the Architect, at the point the pipe passes through the wall or ceiling.

3.0 EXECUTION

3.01 DESIGN AND INSTALLATION

A. The design and installation of the fire suppression systems shall be based on the hazards and classes required by the occupancies indicated.

B. Underground piping shall be provided with a minimum of 3'-0" of ground cover or below the frost line, whichever is deeper. Concrete thrust blocks shall be provided at all changes of direction. Provide restraining rods at all mechanical joints.

3.02 CLEANING, LUBRICATION AND ADJUSTMENT

A. The exterior surfaces of all equipment, piping, conduit, etc., shall be cleaned and free of all dirt, grease, oil, paint splatter, and other construction debris.

B. Bearings that require lubrication shall be lubricated in strict accordance with the manufacturer's recommendations.

C. All control equipment, valves, equipment settings, pressure tanks, etc. shall be adjusted to the settings required for the performance specified.

D. All materials, equipment, etc. subject to weather, corrosion, dust, debris, water etc. to be installed or utilized for the project shall be fully protected. This is inclusive of piping and duct openings and internal fan ventilation intakes and discharges. This Division's scope includes protection and remediation of any and all Division materials, etc. including cleaning, vacuuming, dusting, etc. required for a clean system and operation. Insulation and equipment with electrical connections subject to water shall be replaced in their entirety. Coordinate with all other trades and schedules.

3.03 PAINTING

A. Steel items exposed outside the building, such as equipment supports, uninsulated piping and hangers, which are not factory painted or galvanized, shall be cleaned and painted with one coat of rust inhibiting primer and two coats of asphaltic base aluminum paint. Insulated steel pipes outside the building shall be cleaned and painted with one coat of rust inhibiting primer before installing insulation.

B. Items in exposed ceiling areas shall be painted a colour in coordination with the Architect as allowed by code.

3.04 SUBMITTALS

A. Before preparing submittals, study all Contract Drawings and specifications in detail, obtain manufacturer's recommended instructions, and have submittals prepared based on specific equipment and material proposed for installation. An officer of the contracting firm shall sign all shop drawings (certifying conformance with plans and specifications) before submitting to the Architect or releasing to the field.

B. The submittal process shall not be utilized as an avenue to substitute products after the execution of the contract. Should an unspecified or unequal product be submitted, it will be rejected. If a second attempt at substitution is made during the resubmittal of the same product, then no more reviews of that product will be performed without direct compensation to the Engineer being paid for the additional services required for the third review and any further reviews.

C. All submittals shall be submitted and returned electronically.

D. Submittals will not be accepted for review unless they:

1. Comply with the requirements of Division 1.

2. Include complete information pertaining to all appurtenances and accessories.

3. Are submitted as complete packages which pertain to all related items in Division 21. Separate packages shall be submitted as follows:
   a. All fire protection equipment, piping, specialties, and components

4. Are properly marked with equipment, service or function identification as related to the project and are marked with pertinent specification paragraph number.

E. Submit catalog information, factory assembly drawings, field installation drawings and certifications as required for complete explanation and description of all items of equipment. The submittal data shall provide ample, unquestionable compliance with the Contract Documents.

F. Review of submittals shall not be construed as authorizing any deviations from the plans and specifications unless such deviations are clearly identified and separately submitted in the form of a letter that is enclosed with the submittals.

G. Submittals are required on all manufactured equipment, especially energy consuming equipment. Submittals shall include, but are not limited to, the following items of equipment:
1. Piping and Piping Specialties
2. Sprinkler Heads
3. Piping Shop Drawings
4. Hydraulic Calculations

3.05 SHOP DRAWINGS

A. Shop drawings per the submittal requirements shall be submit to the Design Team with adequate time for multiple rounds of review. Shop drawings shall show "As-Built" conditions including elevations, offsets, transitions, and accessories. Shop drawings shall indicate all code and manufacturer's recommended clearances, access, and coordinate the clearance and access requirements with all other trades.

B. Shop drawings that use keynotes direct from the Design Documents shall not be acceptable as they do not demonstrate coordinate with all other trades, necessary transitions, etc.

C. Shop drawings shall be provided as complete packages in parallel with all trades to document coordination. Floor-by-floor or otherwise piecemeal shop drawings are generally not acceptable.

3.06 FLUSHING

A. All underground lines, before connecting to the sprinkler systems, shall be flushed thoroughly in accordance with NFPA procedures.

3.07 TESTING

A. The entire sprinkler system shall be tested at not less than 200 psi for not less than 2 hours. All leaks discovered shall be repaired by tightening, replacing or re-working the leaking component or joint. Caulking or similar is not permitted.

3.08 WARRANTY

A. All work provided under this Division 21 shall be subject to a minimum one year warranty. The warranty shall include prompt repair or replacement of equipment or system failures and shall include all parts and labor. In addition, all compressors shall carry an additional four year parts-only warranty. Extended warranties shall be provided on all other equipment so specified in other Sections.

END OF SECTION

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION

CONSULTANTS

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BW&A Job No. 2024-1102

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN
ISLANDS

DATE: 03.14.2025
DRAWN BY: Author
CHECKED BY: Checker
APPROVED BY: Approver

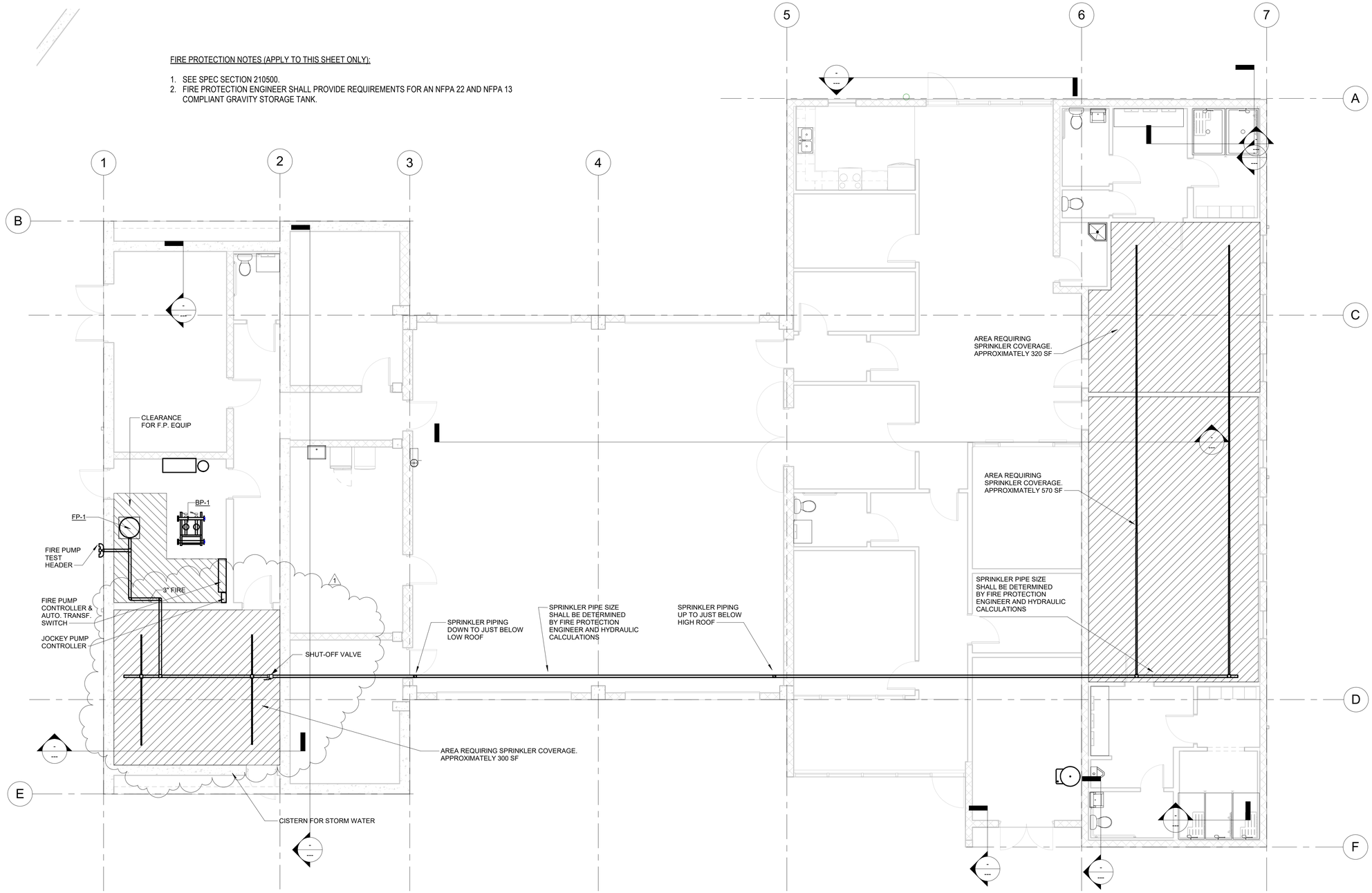
PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: FP0.2

FIRE PROTECTION
SPECIFICATIONS

FIRE PROTECTION NOTES (APPLY TO THIS SHEET ONLY):

1. SEE SPEC SECTION 210500.
2. FIRE PROTECTION ENGINEER SHALL PROVIDE REQUIREMENTS FOR AN NFPA 22 AND NFPA 13 COMPLIANT GRAVITY STORAGE TANK.



1 FP1.0 FIRE PROTECTION PLAN
3/16" = 1'-0"

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION
1	09/05/2025	REV 1

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE: 03.14.2025
DRAWN BY: Author
CHECKED BY: Checker
APPROVED BY: Approver

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: FP1.0

FIRE PROTECTION PLAN

ELECTRICAL GENERAL NOTES

1. ALL WORK IN THIS DIVISION SHALL COMPLY WITH ALL LOCAL BUILDING CODES, LAWS, REGULATIONS, ORDINANCES, AND THE REQUIREMENTS OF THE 2020 NATIONAL ELECTRICAL CODE. ALL WORK SHALL COMPLY WITH BASE BUILDING SPECIFICATIONS. OBTAIN A COPY OF SPECIFICATIONS FROM BUILDING LANDLORD IF NECESSARY.
2. THE CONTRACTOR SHALL KEEP A RECORD OF THE CHANGES WHICH ARE IN CONFLICT WITH THESE DRAWINGS AND SPECIFICATIONS. AT THE COMPLETION OF HIS WORK HE SHALL SUBMIT "AS BUILT" PRINTS TO THE OWNER.
3. DRAWINGS ARE GENERALLY DIAGRAMMATIC AND DO NOT NECESSARILY SHOW EVERY FITTING AND DETAIL. ALL WORK SHALL BE INSTALLED SO THAT JUNCTION BOXES AND COMPONENTS WILL BE ACCESSIBLE FOR SERVICE.
4. ALL SYSTEMS, EQUIPMENT, COMPONENTS, WORK, ETC. PROVIDED UNDER THIS DIVISION SHALL BE COVERED BY A ONE YEAR GUARANTEE STARTING AT THE TIME OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER. ANY DEFECTS IN THE WORK, SYSTEMS, EQUIPMENT, OR COMPONENTS FOUND DURING THIS YEAR SHALL BE CORRECTED AT NO CHARGE. THE GUARANTEE SHALL INCLUDE PROVIDING ALL NECESSARY CUTTING, PATCHWORK, REPAINTING, ETC. TO MAKE THE WORK COMPLETE AND NEW.
5. ALL WORK MUST BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER ACCORDING TO GENERALLY ACCEPTED PRINCIPALS OF FIRST CLASS WORKMANSHIP.
6. ALL ROOF PENETRATIONS SHALL BE AS AUTHORIZED BY ARCHITECT AND OWNER. MAINTAIN ROOF WATERTIGHT INTEGRITY.
7. ALL PENETRATIONS THRU RATED WALLS, FLOORS AND CEILINGS SHALL BE FIRE STOPPED PER NEC.
9. DEVICE BOXES IN RATED WALLS SHALL MEET INTERNATIONAL BUILDING CODE SECTION 706.4.
10. COORDINATE ALL FLOOR CORES AND FLOOR BOXES WITH ARCHITECT AND OWNER.
11. ARC-FLASH HAZARD WARNING SHALL BE PROVIDED ON ALL EQUIPMENT IN AFFECTED ELECTRICAL ROOMS PER NEC 110.16.
12. ALL CONDUCTORS SHALL BE COPPER WITH TYPE "THW" OR "THHN" INSULATION AND THE MINIMUM WIRE SIZE SHALL BE #12 AWG WITH A 167 DEGREE TEMPERATURE RATING.
13. MULTI-WIRE BRANCH CIRCUITS SHALL BE PROVIDED WITH A MEANS THAT WILL SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS PER N.E.C. 210.4(B).
14. NEUTRAL CONDUCTORS FOR CONNECTION TO ALL FURNITURE SYSTEMS TO BE #10AWG.
15. PROVIDE ALL GROUNDING AS REQUIRED BY N.E.C.
16. PROVIDE A SEPARATE GREEN, INSULATED, #12 AWG EQUIPMENT GROUNDING CONDUCTOR ROUTED WITH THE BRANCH CIRCUIT HOMERUN CONDUCTORS.
17. PROVIDE #12 AWG GND FOR ALL MECHANICAL EQUIPMENT UNLESS SHOWN OTHERWISE. ALL EQUIPMENT SHALL BE GROUNDED AT THE PANEL WHICH FEEDS THE EQUIPMENT.
18. ALL CONDUIT MUST BE CONCEALED IN THE WALLS OR ABOVE THE CEILING UNLESS OTHERWISE NOTED. MINIMUM CONDUIT SIZE IS 3/4".
19. ALL CABLE USED IN PLENUM SHALL BE PLENUM-RATED.
20. ARMORED CABLE MAY BE USED IN WALLS AND MILLWORK ONLY AND MUST BE MC TYPE (WITH GROUND). ALL CONDUIT TO AND ABOVE THE CEILING SHALL BE EMT.
21. ARMORED CABLE MAY BE USED FOR LIGHTING CIRCUITING ABOVE CEILINGS AND MUST BE MC TYPE (WITH GROUND). PROVIDE EMT FOR CIRCUIT HOMERUNS.
22. PROVIDE A JUNCTION BOX WITH A 1" CONDUIT STUBBED UP 6" ABOVE ACCESSIBLE CEILING OR TO TELEPHONE BACKBOARD FOR ALL NEW DATA AND TELEPHONE OUTLETS. PROVIDE PULL STRING AND BUSHING AT THE TERMINATION ABOVE ACCESSIBLE CEILING. EXISTING DATA CABLES ARE TO BE REMOVED WHERE NOT BEING UTILIZED. COORDINATE WITH THE TENANT.
23. DUPLEX RECEPTACLES SHALL BE PLASTIC, TWO-POLE, THREE WIRE, SELF-GROUNDING, SIDE-WIRED, 125 VOLTS AND 20A RATED, AND MATCH EXISTING IF POSSIBLE.
24. DEDICATED RECEPTACLES TO RECEIVE VISUAL DESIGNATION.
25. COORDINATE RECEPTACLE NEMA TYPE AND VOLTAGE WITH COPIERS AND EQUIPMENT PRIOR TO INSTALLATION.
26. DEVICE MOUNTING HEIGHTS ARE TO BE MEASURED TO THE DEVICE CENTERLINE UNLESS NOTED OTHERWISE.
27. PROVIDE A LAMINATED LABEL ON COVERPLATE FOR ALL OUTLETS IDENTIFYING PANEL AND BREAKER NUMBER FROM WHICH IT IS FED.
28. BLANK FACEPLATES ARE NOT ALLOWED, U.N.O. ANY EXISTING OUTLET OR TELE/DATA LOCATION NOT USED OR SHOWN WITHIN THE SCOPE OF WORK IN THESE PLANS SHOULD BE REMOVED, PATCHED, AND REPAIRED.
29. ALL SWITCHES FOR FANS, LIGHTS, ETC. WHICH ARE SHOWN TO BE MOUNTED IN THE SAME GENERAL AREA SHALL SHARE A MULTI-GANG COVER PLATE AS REQUIRED.
30. ALL DIMMERS SHALL BE LUTRON NOVA T-STAR SERIES UNLESS NOTED OTHERWISE. DIMMER SWITCH SHALL BE FULLy COMPATIBLE WITH THE LIGHT FIXTURES IT CONTROLS. COORDINATE DIMMING PROTOCOL (0-10V, ELV, ETC.) WITH LIGHT FIXTURE MANUFACTURER. COORDINATE FINISH WITH ARCHITECT.
31. FASTEN ALL RECESSED LIGHTING FIXTURES TO STRUCTURE OR GRID PER NEC.
32. PROVIDE A NEUTRAL CONDUCTOR FOR SWITCHES CONTROLLING LIGHTING LOADS PER NEC 404.2(C). CAP NEUTRAL CONDUCTOR WHERE NOT REQUIRED BY MANUFACTURER.
33. LIGHTING CONTROL SYSTEMS SHALL MEET 2009 IECC.
34. PROVIDE ENGRAVED NAMEPLATE ON ALL NEW PANELS INDICATING PANEL NAME AND SOURCE PER NEC 408.4(B).
35. PROVIDE A PRINTED PANEL SCHEDULE FOR ALL PANELS WITHIN SCOPE OF WORK. CORRECTLY LABEL ALL NEW CIRCUITS, SPARES AND SPACES IN ACCORDANCE WITH NEC 408.4.
36. CONTRACTOR SHALL CLEAN SITE AT END OF PROJECT. ALL DUST, DEBRIS, OILS, SPRAYS, FINGERPRINTS, AND LABELS SHALL BE REMOVED FROM ALL EXPOSED FINISHED SURFACES. ELECTRICAL AND TELEPHONE ROOMS SHALL BE PUT BACK AS FOUND; FLOORS ARE TO BE SWEPT, MOPPED, AND REPAINTED.

LIGHTING FIXTURE SCHEDULE
(SPECIFIED BY ENGINEER)

TYPE — **DESCRIPTION**

A — 2'X4' LED SPECIFICATION GRADE TROFFER. PROVIDE WITH UNIVERSAL VOLTAGE DRIVER. PROVIDE WITH 0-10V DIMMING DRIVER. 4000K COLOR TEMPERATURE. 4000 LUMENS. 80 CRI.
LAMPS: 31.6W LED
MANUF: COOPER CRUZE 24CZ2-40 SERIES

AE — SAME AS TYPE 'A' BUT WITH 90-MINUTE BATTERY BACKUP

A2 — 2'X4' LED SPECIFICATION GRADE TROFFER. PROVIDE WITH UNIVERSAL VOLTAGE DRIVER. PROVIDE WITH 0-10V DIMMING DRIVER. 4000K COLOR TEMPERATURE. 3500 LUMENS. 80 CRI.
LAMPS: 27.6W LED
MANUF: COOPER CRUZE 24CZ2-35 SERIES

A2E — SAME AS TYPE 'A2' BUT WITH 90-MINUTE BATTERY BACKUP

B — 2'X2' LED SPECIFICATION GRADE TROFFER. PROVIDE WITH UNIVERSAL VOLTAGE DRIVER. PROVIDE WITH 0-10V DIMMING DRIVER. 4000K COLOR TEMPERATURE. 2000 LUMENS. 80 CRI.
LAMPS: 30W LED
MANUF: COOPER CRUZE 22CZ2 SERIES

BE — SAME AS TYPE 'B' BUT WITH 90-MINUTE BATTERY BACKUP

C — SUSPENDED 4' LED FIXTURE. PROVIDE WITH UNIVERSAL VOLTAGE DRIVER. PROVIDE WITH 0-10V DIMMING DRIVER. 4000K COLOR TEMPERATURE. 3000 LUMENS. 80 CRI.
LAMPS: 24.9W LED
MANUF: COOPER 4SNLED-LD5-30SL SERIES

CE — SAME AS TYPE 'C' BUT WITH 90-MINUTE BATTERY BACKUP

C2 — SUSPENDED 4' LED FIXTURE. PROVIDE WITH UNIVERSAL VOLTAGE DRIVER. PROVIDE WITH 0-10V DIMMING DRIVER. 4000K COLOR TEMPERATURE. 5000 LUMENS. 80 CRI.
LAMPS: 47.1W LED
MANUF: COOPER 4SNLED-LD5-50SL SERIES

C2E — SAME AS TYPE 'C2' BUT WITH 90-MINUTE BATTERY BACKUP

D — 1'X4' LED HIGH BAY LAY-IN FIXTURE. PROVIDE WITH UNIVERSAL VOLTAGE DRIVER. PROVIDE WITH 0-10V DIMMING DRIVER. 4000K COLOR TEMPERATURE. 9000 LUMENS.
LAMPS: 64.2W LED
MANUF: METALUX VT4LED-LD5-9 SERIES

DE — SAME AS TYPE 'D', BUT WITH 90-MINUTE BATTERY BACKUP

E — 4" RECESSED LED DOWNLIGHT. PROVIDE WITH UNIVERSAL VOLTAGE DRIVER. PROVIDE WITH 0-10V DIMMING DRIVER. 4000K COLOR TEMPERATURE. 1500 LUMENS. 80 CRI.
LAMPS: 15W LED
MANUF: COOPER LB4B15-M SERIES

FE — LED WALL PACK. PROVIDE WITH UNIVERSAL VOLTAGE DRIVER. COORDINATE COLOR TEMPERATURE, FINISH, AND ALL OTHER OPTIONS WITH ARCHITECT. PROVIDE WITH 90-MINUTE BATTERY BACKUP.
LAMPS: TBD
MANUF: BEGA 24374 SERIES

G — POLE MOUNTED LED FIXTURE WITH ONE HEAD. PROVIDE WITH 25' POLE. POLE SHALL BE RATED FOR HURRICANE FORCE WINDS. COORDINATE POLE BASE WITH ARCHITECT. PROVIDE WITH UNIVERSAL VOLTAGE DRIVER. 4000K COLOR TEMPERATURE. 70 CRI. TYPE IV FORWARD THROW OPTICS. 16 LED LIGHT SQUARE. 2 LIGHT SQUARES. OUTPUT LEVEL 3.
LAMPS: 108W LED
MANUF: COOPER LIGHTING GALN SERIES

X — LED EDGE-LIT EXIT SIGN WITH CONTINUOUS ILLUMINATION. PROVIDE WITH UNIVERSAL VOLTAGE DRIVER. PROVIDE MIRRORED BACKING FOR SINGLE FACED. PROVIDE DIRECTIONAL ARROWS, DOUBLE OR SINGLE FACE AS INDICATED ON DRAWINGS. PROVIDE WITH 90-MINUTE BATTERY BACKUP.
LAMPS: COOPER ES SERIES

ELECTRICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION	ON CENTER MTG. HT.
	CONCEALED CONDUIT IN CEILING OR WALL	
	CONCEALED CONDUIT IN FLOOR OR UNDERGROUND	
	CIRCUIT HOMERUN TO PANEL; EACH ARROWHEAD = 1 CIRCUIT 2#12,1#12G.,1/2"C. UNLESS NOTED OTHERWISE	
	NO. OF CONDUCTORS IN CONDUIT; EACH CROSSHATCH = 1 WIRE	
	CONDUIT STUBBED UP OR TURNED DOWN	
	MULTI OUTLET SURFACE MOUNTED RACEWAY	
	PLYWOOD BACKBOARD	
	WALL MOUNTED DUPLEX RECEPTACLE OUTLET	18"
	WALL MOUNTED G.F.C.I. DUPLEX RECEPTACLE OUTLET	18"
	WALL MOUNTED DEDICATED DUPLEX RECEPTACLE OUTLET	18"
	WALL MOUNTED DOUBLE DUPLEX RECEPTACLE OUTLET	18"
	WALL MOUNTED SPECIAL RECEPTACLE OUTLET	18"
J	JUNCTION BOX - SIZE AND MOUNTING AS REQUIRED	AS REQ'D.
JCP	JUNCTION BOX FOR CONNECTION OF CONDENSATE PUMP. COORDINATE WITH DIVISION 23.	AS REQ'D.
	WALL MOUNTED DATA/TELEPHONE OUTLET	18"
	120/208 VOLT PANELBOARD	
F	FIRE ALARM PULL STATION	42"
F	FIRE ALARM ADA APPROVED AUDIO/VISUAL ALARM	84" A.F.F. or 6" BELOW CEILING, WHICHEVER IS LOWER
	FIRE ALARM ADA APPROVED VISUAL ALARM - WALL MOUNTED	
M	MOTOR RATED TOGGLE SWITCH	AS REQ'D.
30/3	DISCONNECT SWITCH (FRAME/POLES/FUSE-IF REQUIRED)	
	EXIT SIGN - CEILING,WALL MT.	
AFF/AFG	ABOVE FINISHED FLOOR/ABOVE FINISHED GRADE	
BC	BELOW CEILING	
AC	ABOVE COUNTER	
WP	WEATHER PROOF	
EX/R/N	EXISTING/RELOCATED/NEW	
M	MOTORIZED DAMPER. COORDINATE FINAL LOCATION AND CONNECTION REQUIREMENTS WITH DIVISION 23.	

LIGHTING SYMBOL LEGEND - ACUITY

SYMBOL	DESCRIPTION	ON CENTER MTG. HT.
S	WALL MOUNTED S.P.S.T. TOGGLE SWITCH	
S D	WALL MOUNTED DIMMER SWITCH (ACUITY SPODMRD SERIES OR APPROVED EQUAL)	
S OV	LOW VOLTAGE OVERRIDE SWITCH FOR TIMECLOCK (ACUITY nPODM)	
S VS	WALL MOUNTED VACANCY SENSOR SWITCH (ACUITY WSXA-PDT-SA)	
S LV	WALL MOUNTED LOW VOLTAGE MOMENTARY SWITCH. INTERFACE WITH LOCAL SWITCHPACK SERVING THE AREA. (ACUITY nLIGHT nPODMA SERIES)	
S LVD	WALL MOUNTED LOW VOLTAGE DIMMING CONTROL STATION FOR VACANCY CONTROL. INTERFACE WITH LOCAL SWITCHPACK(S) SERVING THE AREA. (ACUITY nPODM DX SERIES)	
S OS	WALL MOUNTED OCCUPANCY SENSOR SWITCH (ACUITY WSXA-PDT)	
PP	ON/OFF SWITCHPACK. INTERFACE WITH LOCAL MOTION SENSORS. (ACUITY nPP16 SERIES)	
MS	CEILING MOUNTED VACANCY SENSOR. INTERFACE WITH LOCAL POWERPACK SERVING THE AREA. (ACUITY nLIGHT nCM-PDT-10 SERIES)	
D	DIMMING POWERPACK. INTERFACE WITH LOCAL MOTION SENSORS. PROVIDE 0-10V CONTROL WIRES TO DOWNSTREAM FIXTURES. PROVIDE WITH VACANCY MODE CONTROLS. (ACUITY nLIGHT nPP16-D SERIES)	

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ESTATE FORTUNA (TANGO CO.) FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE:	03.14.2025
DRAWN BY:	L. ORTIZ
CHECKED BY:	J. CLARK
APPROVED BY:	J. CLARK

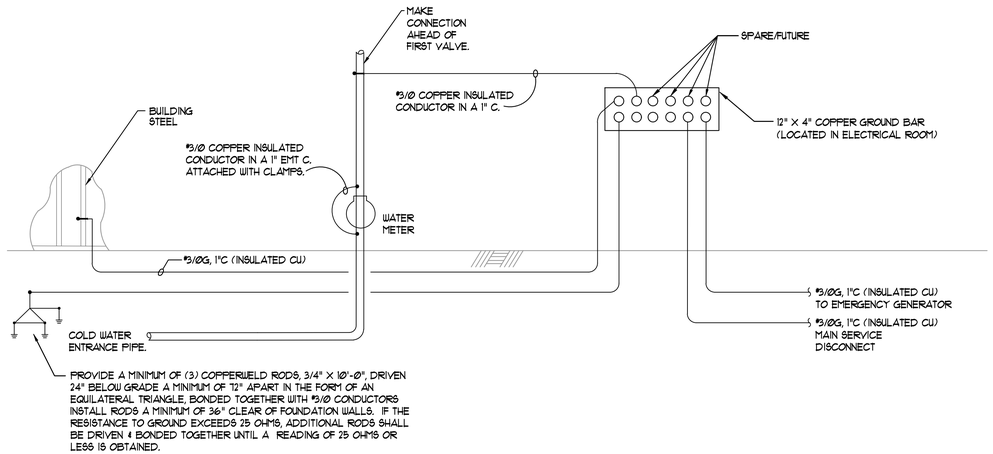
PROJECT NO.: 23-005.D

CONTRACT NO.: -

SHEET NO.: E0.0

ELECTRICAL LEGEND, SCHEDULES, AND GENERAL NOTES

PROFESSIONAL ENGINEER
JASON CLARK
0-56990-118
U.S. VIRGIN ISLANDS

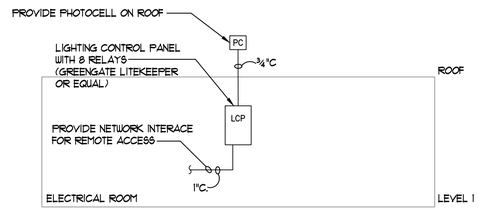


1 / E0.1 ELECTRICAL GROUND BAR DETAIL

NOT TO SCALE

GENERAL NOTES:
(APPLY TO THIS DETAIL ONLY)

1. ALL GROUNDING CONDUCTORS SHALL BE INSULATED COPPER UNLESS NOTED OTHERWISE.
2. SEE ELECTRICAL RISER DIAGRAM FOR MORE INFORMATION REGARDING EQUIPMENT.
3. GROUND PER ARTICLE 250 OF THE NEC.
4. DRAWING IS DESIGN INTENT ONLY. FIELD COORDINATE EXACT LOCATION AND MOUNTING HEIGHT OF GROUND BAR.



2 / E0.1 LIGHTING CONTROL RISER DIAGRAM

NO SCALE

NOTE:
THIS LIGHTING CONTROL SYSTEM SHALL AUTOMATICALLY SWITCH LIGHTING CIRCUITS ON AND OFF AT PREPROGRAMMED TIMES AS SCHEDULED BY THE OWNER. WHEN LIGHTS ARE IN THE OFF STATE, ACTUATION OF ANY OVERRIDE SWITCH WILL TURN THE LIGHTS IN THAT SWITCHES ZONE ON FOR UP TO (BUT NOT EXCEEDING) TWO HOURS.

LIGHTING CONTROL NOTES:

1. COORDINATE SETTINGS OF CONTROL SYSTEM WITH OWNER.
2. CONTRACTOR SHALL PROVIDE A COMPLETE INSTALLATION. PROVIDE ANY ADDITIONAL COMPONENTS AND ACCESSORIES AS NECESSARY. COORDINATE PROGRAMMING WITH OWNER.

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

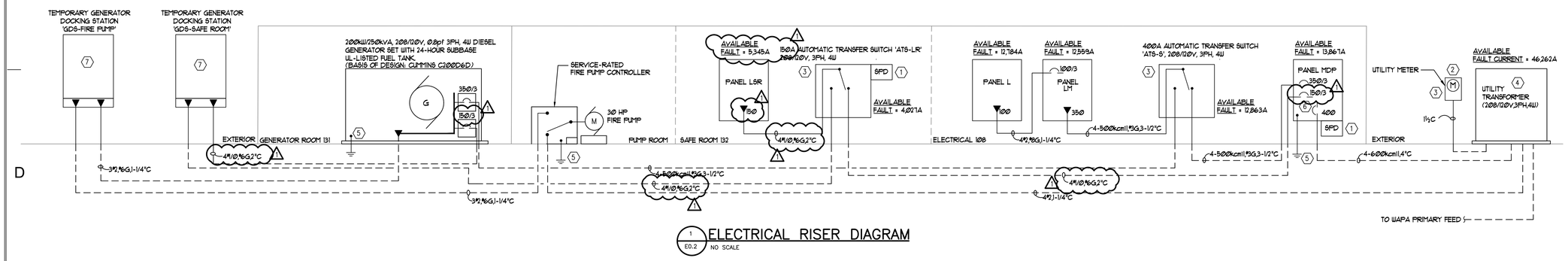
DATE: 03.14.2025
DRAWN BY: L. ORTIZ
CHECKED BY: J. CLARK
APPROVED BY: J. CLARK

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: E0.1

ELECTRICAL DETAILS

PROFESSIONAL ENGINEER
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1 E0.2 ELECTRICAL RISER DIAGRAM
NO SCALE

GENERAL NOTES:
(APPLY TO THIS SHEET ONLY)

1. WIRE SIZES ARE FOR COPPER CONDUCTORS.
2. CONTRACTOR TO VERIFY EQUIPMENT WILL FIT IN LOCATIONS AS SHOWN TO INSTALLATION.
3. REFER TO PANELBOARD SCHEDULES FOR ADDITIONAL INFORMATION.
4. PROVIDE ARC-FLASH RATINGS ON ALL PANELBOARDS.
5. AVAILABLE FAULT CURRENTS ARE INDICATED ADJACENT TO EACH PANELBOARD. WHERE NO VALUE IS SHOWN, THE CALCULATED VALUE IS LESS THAN THE MINIMUM RATING. PROVIDE FULLY RATED PANELS/BREAKERS THAT EQUAL OR EXCEED VALUES INDICATED FOR ALL PANELS RATED 800 AMPS AND ABOVE. ALL PANELS RATED LESS THAN 800 AMPS SHALL BE U.L. SERIES RATED TO MEET OR EXCEED VALUES INDICATED. SHOP DRAWINGS SHALL INCLUDE ALL RATINGS.
6. PROVIDE ENGRAVED NAMEPLATES FOR ALL ELECTRICAL EQUIPMENT INCLUDING TRANSFER SWITCH, PANELBOARDS, DISCONNECTS, ETC.

LEGEND NOTES:
(APPLY TO THIS SHEET ONLY)

(1) PROVIDE WITH TYPE 1 SURGE PROTECTION DEVICE EXTERNAL TO DISCONNECT. MAXIMUM FEEDER LENGTH SHALL BE 2', MINIMIZE BENDING OF CONNECTION. DEVICE SHALL BE CURRENT TECHNOLOGY SEL3 OR EQUAL BY EATON, ABB, OR SCHNEIDER ELECTRIC. PROVIDE WITH NEMA 3R ENCLOSURE.

(2) COORDINATE ALL METERING REQUIREMENTS WITH POWER COMPANY. PROVIDE TRANSFORMER AND CONCRETE PAD PER POWER COMPANY REQUIREMENTS.

(3) PROVIDE START CONTACT MONITORING SOLUTION THAT CHECKS THE INTEGRITY OF THE GENERATOR REMOTE START CIRCUIT. THE CIRCUIT SHOULD BE MONITORED FOR BROKEN, DISCONNECTED, OR SHORTED WIRES. LOSS OF INTEGRITY SHALL ANNUNCIATE AN ALARM AT THE GENERATOR CONTROLLER AND SHALL START THE GENERATOR.

(4) COORDINATE EXACT FAULT CURRENT WITH UTILITY COMPANY PRIOR TO RUNNING STUDIES AS REQUIRED BY SPECIFICATIONS.

(5) PROVIDE CONNECTION BETWEEN ALL SYSTEM GROUNDS (MAIN SERVICE DISCONNECT, FIRE PUMP, AND GENERATOR) TO MAKE ONE GROUNDING SYSTEM. PROVIDE GROUNDING PER ELECTRICAL SPECIFICATIONS AND NEC.

(6) PROVIDE SERVICE-RATED, MAIN CIRCUIT BREAKER.

(7) PROVIDE 100A DOCKING STATION CABINET WITH PHASE ROTATION MONITORING AND CAM LOCKS FOR CONNECTION OF TEMPORARY GENERATOR (TRYSTAR TMTS-1 SERIES OR EQUAL). PROVIDE WITH 4-POLE MANUAL TRANSFER SWITCH TO PREVENT INADVERTENT INTERCONNECTION BETWEEN THE ON-SITE GENERATOR AND THE TEMPORARY GENERATOR. PROVIDE AUXILIARY CONTACTS AND INTERFACE WITH GENERATOR CONTROLLER TO PROVIDE NOTIFICATION TO REMOTE GENERATOR ANNUNCIATOR WHEN THE ON-SITE GENERATOR SOURCE IS DISCONNECTED. PROVIDE WITH PAD LOCK AND TAMPER-RESISTANT, NEMA 3R ENCLOSURE. COORDINATE EXACT INSTALLATION AND WIRING REQUIREMENTS WITH MANUFACTURER AND PROVIDE ALL MATERIALS AND INTERCONNECTING WIRES AS REQUIRED FOR A COMPLETE AND OPERABLE INSTALLATION.

(8) PROVIDE 2" CONDUIT FOR MEDIUM VOLTAGE CONNECTION TO NEAREST WAPA SERVICE CONNECTION POINT. ELECTRICAL CONTRACTOR SHALL INCLUDE TRANSFORMER, ALL CONDUCTORS, CONDUIT, TRENCHING, ETC. IN THEIR PRICING FOR A COMPLETE AND OPERABLE ELECTRICAL SERVICE. COORDINATE WITH WAPA.

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION
1	09/05/2025	REV 1

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.) FIRE STATION
NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

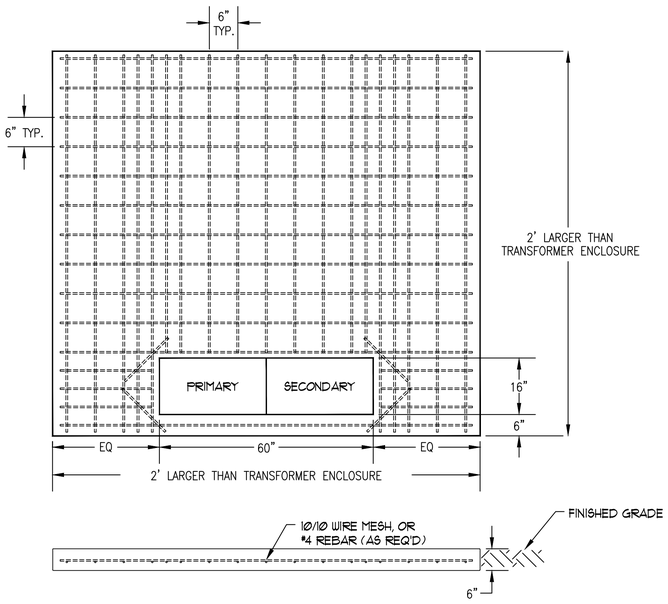
DATE: 03.14.2025
DRAWN BY: L. ORTIZ
CHECKED BY: J. CLARK
APPROVED BY: J. CLARK

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: E0.2

ELECTRICAL RISER DIAGRAM

PROFESSIONAL ENGINEER
JASON CLARK
0-5690-111
U.S. VIRGIN ISLANDS



1 / E0.0 UTILITY TRANSFORMER PAD DETAIL

NO SCALE

UTILITY TRANSFORMER PAD DETAIL NOTES:
(APPLY TO THIS DETAIL ONLY)

1. DETAIL IS FOR DESIGN INTENT PURPOSES ONLY. EXACT REQUIREMENTS, SPECIFICATIONS, AND DIMENSIONS MAY VARY DEPENDING ON THE UTILITY TRANSFORMER SIZE AND THE SPECIFIC POWER COMPANY'S REQUIREMENTS. ELECTRICAL CONTRACTOR SHALL CONFIRM SPECIFICATIONS AND DIMENSIONS WITH POWER COMPANY PRIOR TO CONSTRUCTION.
2. TRANSFORMER PADS SHALL WITHIN 6" OF FINAL GRADE AND SHALL BE INSTALLED IN A LOCATION TO REMAIN READILY ACCESSIBLE FOR LINE TRUCKS. COORDINATE MINIMUM CLEARANCE FROM OBSTRUCTIONS AND BUILDINGS WITH POWER COMPANY. COORDINATE EXACT SPECIFICATIONS AND REQUIREMENTS WITH POWER COMPANY PRIOR TO INSTALLATION.
3. CONCRETE SHALL HAVE A MINIMUM ULTIMATE 28 DAY COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 POUNDS–PER–SQUARE INCH. PAD SHALL BE CURED NOT LESS THAN 72 HOURS PRIOR TO INSTALLATION OF TRANSFORMER.
4. REINFORCING MATERIAL SHALL BE 6" X 6" (10/10 WIRE MESH) INSTALLED 1" FROM BOTTOM OF BAD.
5. TOP OF PAD SHALL BE 2" ABOVE FINISHED GRADE AND HAVE A 1" X 1" BEVEL AROUND TOP EDGE.
6. SOIL UNDERNEATH PADS SHALL BE FREE OF ROOTS AND OTHER ORGANIC MATERIALS AND BE THOROUGHLY TAMPED TO PREVENT WASHING. EXERCISE CARE IN BACKFILLING AND GRADING AROUND PAD.
7. BRING THE SERVICE–ENTRANCE CONDUCTORS OUT TO A POINT OF DELIVERY, INSTALLED IN ACCORDANCE WITH ALL NATIONAL AND LOCAL CODES, LEAVING ADEQUATE CABLE LENGTHS FOR POWER COMPANY TO MAKE CONNECTIONS AT THE POINT OF DELIVERY. COORDINATE EXACT REQUIREMENTS AND CABLE LENGTHS WITH POWER COMPANY PRIOR TO ROUGH–IN AND INSTALLATION.
8. SECONDARY SERVICE DUCT SHALL BE LOCATED IN THE EXTREME RIGHT–READ SIDE OF THE SECONDARY COMPARTMENT. CONDUITS SHALL STUB UP BETWEEN 1" AND 3" ABOVE SECONDARY COMPARTMENT. COORDINATE EXACT REQUIREMENTS WITH POWER COMPANY.
9. USE FIRE ANT CONTROL UNDER ENTIRE PAD INCLUDING PAD OPENINGS
10. OTHER UTILITIES ARE NOT PERMITTED TO BE INSTALLED UNDER TRANSFORMER PAD. COORDINATE MINIMUM CABLE CLEARANCE WITH POWER COMPANY.

(NEW) **PANEL LM**

VOLTAGE: 208 / 120 — AMP: 350
PHASE: 3 — MAIN: MLO

DESCRIPTION	KW	BKR	CK	PH	CK	BKR	KW	DESCRIPTION
APP. BAY 124 DOOR OP.	1.0	20/2	1	A	2	20/1	1.7	EF-1
-------	1.0	---	3	B	4	20/1	0.5	EF-2
APP. BAY 124 DOOR OP.	1.0	20/2	5	C	6	50/3	4.2	WH-1
-------	1.0	---	7	A	8	---	4.2	-----
APP. BAY 124 DOOR OP.	1.0	20/2	9	B	10	---	4.2	-----
-------	1.0	---	11	C	12	20/3	1.0	WH-2
APP. BAY 124 DOOR OP.	1.0	20/2	13	A	14	---	1.0	-----
-----	---	---	15	B	16	---	1.0	-----
SPARE		25/2	17	C	18	20/1	0.4	MATRAY
-----		---	19	A	20	20/1		SPARE
CU-3	3.4	35/2	21	B	22	20/1	0.5	DAYROOM DAMPERS
-----	3.4	---	23	C	24	20/2	1.0	ACD-1
SPARE		20/1	25	A	26	---	1.0	-----
SPARE		20/1	27	B	28	20/2	1.0	ACD-2
CU-4	3.4	35/2	29	C	30	---	1.0	-----
-----	3.4	----	31	A	32	20/1	0.1	WINDOWS FOR WAITING
SPARE		20/1	33	B	34	20/1		SPARE
SPARE		20/1	35	C	36	20/1		SPARE
CU-5	2.0	15/2	37	A	38	20/1		SPARE
-----	2.0	---	39	B	40	20/1		SPARE
FCU-5	0.4	15/2	41	C	42	20/1		SPARE
-----	0.4	---	43	A	44	20/1		SPARE
CU-6	2.3	25/2	45	B	46	20/1		SPARE
-----	2.3	---	47	C	48	20/1		SPARE
FCU-6	0.6	15/2	49	A	50	35/3		SPARE
-------	0.6	---	51	B	52	---		-----
TEF-1	0.5	20/1	53	C	54	---		-----
TEF-2	0.5	20/1	55	A	56	100/3	10.8	PANEL 'L'
TEF-3	0.5	20/1	57	B	58	---	11.1	-----
IWH-A	1.8	20/1	59	C	60	---	10.2	-----

Phase A Load (kVA)	28.7	Connected kVA	90.8	95% A-B Balance
Phase B Load (kVA)	30.4	Dem. kVA	82.3	96% B-C Balance
Phase C Load (kVA)	31.7	Dem. Amps	228.5	91% C-A Balance

(NEW) **PANEL L**

VOLTAGE: 208 / 120 — AMP: 100
PHASE: 3 — MAIN: MLO

	DESCRIPTION	KW	BKR	CK	PH	CK	BKR	KW	DESCRIPTION
	APP. BAY 124 REC	0.9	20/1	1	A	2	60/2	4.8	KITCHEN 107 RANGE
	SPARE		20/1	3	B	4	---	4.8	-----
	FIT. ROOM 106 DED REC	1.2	20/1	5	C	6	20/1	0.9	KITCHEN MTR REC
	SPARE		20/1	7	A	8	20/1		SPARE
	SPARE		20/1	9	B	10	20/1		EXPEDITOR SHELVES
	FITNESS ROOM 106 REC	1.3	20/1	11	C	12	20/1	0.4	EMS OFFICE 104 REC
	FIT. ROOM 106 DED REC	1.2	20/1	13	A	14	20/1	0.9	MALE/FEMALE DORM LTS
	SPARE		20/1	15	B	16	20/1	0.8	ELECTRICAL LTS
	MALE/FEMALE DORM REC	1.2	20/1	17	C	18	20/1	0.4	EXTERIOR LTS
	STORAGE 122 REC	0.5	20/1	19	A	20	20/1	0.5	APPARATUS BAY LTS
$	FEMALE DORM S 110 REC	1.3	20/1	21	B	22	20/1	0.6	DAYROOM, DINING 105 LTS
$	MALES DORM S 115 REC	1.4	20/1	23	C	24	20/1		SPARE
	JANITOR 109 REC	0.5	20/1	25	A	26	20/1		SPARE
	DAYROOM/DINING 105 REC	1.4	20/1	27	B	28	20/1		SPARE
$	FE. BATH. 111 DED REC	1.2	20/1	29	C	30	20/1		SPARE
	ELECTRICAL 108 DED REC	0.4	20/1	31	A	32	20/1		SPARE
	FACP 108	1.0	20/1	33	B	34	20/1		SPARE
	LCP 108	1.0	20/1	35	C	36	20/1		SPARE
#	KITCHEN 107 DISHWASHER	1.2	20/1	37	A	38	20/1		SPARE
	KITCHEN 107 FRIDGE	0.8	20/1	39	B	40	20/1		SPARE
	KITCHEN 107 MICROWAVE	1.8	20/1	41	C	42	20/1		SPARE

- CONNECT TO GFCI CIRCUIT BREAKER
$ - CONNECT TO AFCI CIRCUIT BREAKER

Phase A Load (kVA)	10.8	Connected kVA	32.1	98% A-B Balance
Phase B Load (kVA)	11.1	Dem. kVA	23.6	92% B-C Balance
Phase C Load (kVA)	10.2	Dem. Amps	65.6	94% C-A Balance

(NEW) **PANEL LSR**

VOLTAGE: 208 / 120 — AMP: 150
PHASE: 3 — MAIN: MLO

DESCRIPTION	KW	BKR	CK	PH	CK	BKR	KW	DESCRIPTION
CU-1	3.4	35/2	1	A	2	20/1	0.4	GENERATOR RM. 131 REC
-----	3.4	---	3	B	4	20/1	0.5	TURN. 128 WASHER REC
JOCKEY PUMP	0.8	15/3	5	C	6	45/2	3.6	TURN. 128 DRYER REC
-----	0.8	---	7	A	8	---	3.6	-----
-----	0.8	---	9	B	10	20/1	0.7	STORAGE 125 REC
EQUIP. MAIN. 127 REC	0.9	20/1	11	C	12	20/1	1.0	SAFE ROOM LTS
MOTORIZED DAMPERS	0.5	20/1	13	A	14	20/1	0.5	UTILITY ROOM 132 REC
EF-3	0.2	20/1	15	B	16	20/1	0.6	GEN. BATTERY CHARGER
TEF-4	0.6	20/1	17	C	18	20/1	1.0	FUEL STATION J-BOX
MOTORIZED DAMPERS	0.2	20/1	19	A	20	35/3	2.5	BP-1
GENERATOR ROOM LTS	0.1	20/1	21	B	22	---	2.5	-----
SAFE ROOM 133 REC	0.5	20/1	23	C	24	---	2.5	-----
MOTOR DAMPERS	0.5	20/1	25	A	26	20/1		SPARE
EF-4	0.5	20/1	27	B	28	25/2	2.5	CU-2
CONDENSATE PUMP	0.4	20/1	29	C	30	---	2.5	-----
SPACE			31	A	32	20/1		SPARE
SPACE			33	B	34	20/1		SPARE
SPACE			35	C	36	20/1		SPARE
SPACE			37	A	38	20/1		SPARE
SPACE			39	B	40	20/1		SPARE
SPACE			41	C	42	20/1		SPARE

- CONNECT TO GFCI CIRCUIT BREAKER

Phase A Load (kVA)	12.4	Connected kVA	37.7	94% A-B Balance
Phase B Load (kVA)	11.7	Dem. kVA	37.5	86% B-C Balance
Phase C Load (kVA)	13.6	Dem. Amps	104.1	91% C-A Balance

(NEW) **PANEL MDP**

VOLTAGE: 208 / 120 — AMP: 400
PHASE: 3 — MAIN: MCB

DESCRIPTION	KW	BKR	CK	PH	CK	BKR	KW	DESCRIPTION
SPACE			1	A	2			SPACE
SPACE			3	B	4			SPACE
SPACE			5	C	6			SPACE
SPACE			7	A	8			SPACE
SPACE			9	B	10			SPACE
SPACE			11	C	12			SPACE
SPACE			13	A	14			SPACE
SPACE			15	B	16			SPACE
SPACE			17	C	18			SPACE
SPACE			19	A	20			SPACE
SPACE			21	B	22			SPACE
SPACE			23	C	24			SPACE
SPACE			25	A	26			SPACE
SPACE			27	B	28			SPACE
SPACE			29	C	30			SPACE
SPACE			31	A	32			SPACE
SPACE			33	B	34			SPACE
SPACE			35	C	36			SPACE
ATS-S	28.7	350/3	37	A	38	150/3	12.4	ATS-LR
-----	30.4	---	39	B	40	---	11.7	-----
-----	31.7	---	41	C	42	---	13.6	-----

Phase A Load (kVA)	41.2	Connected kVA	128.5	98% A-B Balance
Phase B Load (kVA)	42.1	Dem. kVA	114.8	93% B-C Balance
Phase C Load (kVA)	45.3	Dem. Amps	318.7	91% C-A Balance

REVISIONS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE: 03.14.2025
DRAWN BY: L. ORTIZ
CHECKED BY: J. CLARK
APPROVED BY: J. CLARK

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: E0.3

PANEL SCHEDULES & UTILITY TRANSFORMER PAD DETAIL

PROFESSIONAL ENGINEER
JASON CLARK
0-5690-118
U.S. VIRGIN ISLANDS

SECTION 260100
ELECTRICAL GENERAL

1.0 GENERAL

1.01 SCOPE

A. Division 26 includes all Specifications in the 260000 series and the accompanying Electrical Drawings. Provide all labor, materials and equipment, and all necessary operations to provide the compete the complete scope of the electrical systems intended under this Division. Division 26 is not a stand alone document, but a part of the complete Project Documents.

B. Attention is called to the fact that there are many interfaces between the work required in this Division and the work required in other Divisions. Provide the necessary interface and coordination with other Divisions to provide a complete project.

1.02 EXISTING CONDITIONS

A. Attention is called to the fact that the work is to be performed within an existing, operational facility. Prior to the submission of bids, each bidder shall visit the project site, thoroughly investigate and be familiar with all existing conditions which will affect their work; especially the work to be performed above the existing ceilings.

B. When the project is finished, the work under this Division shall be complete in every respect, completely integrated with all the existing systems, and left in perfect operating condition. the electrical service to the building shall not be interrupted at any time without written coordination of the building's Owner. All existing electrical equipment removed during the project shall be removed from the site after inspection of the building's Owner. all existing electrical systems required to be operating at the project's completion or required to remain in use during the project shall be reconnected, replaced, rerouted or otherwise made to fit with proper workmanship techniques and left in safe working order.

C. Connect new work to existing work in a neat and workmanlike manner. Where an existing structure must be cut or existing utilities interfere, such obstructions shall be bypassed, removed, replaced, are relocated, patched and repaired. Work disturbed or damaged shall be replaced or repaired to its prior condition.

D. Prior to the start of any demolition or construction, secure the services of a qualified, EPA Certified asbestos abatement agency to check the existing insulation, etc. for asbestos. Should asbestos be found, do not proceed with demolition or construction; notify the Architect in any case in writing of the agency's findings.

1.03 CODES AND REGULATIONS

A. All work under this Division shall comply with all local building codes, laws, regulations, ordinances and the requirements of the 2020 National Electrical Code.

B. Where conflicts of installation requirements occur between the aforementioned codes, regulations or the Contract Documents, the most restrictive shall govern.

C. Obtain all permits and licenses and pay all fees required by local authorities. Arrange for all necessary inspections required by the authorities having jurisdiction and provide written certificates of approval to the project Owner or his designated representative.

1.04 DEFINITIONS

A. Contract Documents: The complete set of project Drawings and Specifications.

B. Provide: Furnish, install and connect.

C. Work: All materials installed, including all labor to provide complete system.

D. Wiring or Wired: All wire or cable installed in conduit from panelboard to equipment and connected at both ends with all required boxes, connectors, couplings, etc.

E. Conduit: Rigid steel conduit intermediate metal conduit (I.M.C.), electrical metallic tubing (EMT), plastic conduit (PVC), or flexible steel conduit.

1.05 DRAWINGS AND SPECIFICATIONS

A. The Drawings and Specifications together are to be considered as the Contract Documents. Any work shown in one and not shown in the other, or implied by either, shall be provided to give a complete project.

B. Should any conflicts exist between the Drawings and Specifications or there is an item shown/called for which is not clearly defined, immediately submit a request for clarification. No additional monies will be granted later when a conflict is resolved or an item is more clearly defined.

C. The Drawings are schematic and are not intended to show the exact location outlets, etc. or the routing of conduit.

D. The exact location of equipment requiring electrical connections (mechanical equipment, elevators, lights, etc.) shall be as located by other Divisions of the Contract Documents. Refer to the Architectural, Structural and Mechanical Documents for dimensions and details of building construction and provide work described in this Division so that it conforms to the details of the project. The right is reserved to relocate any receptacle, switch or other outlet a maximum of 10'-0" before it is permanently installed without incurring additions to the Contract amount.

1.06 SITE VISIT

A. Visit the site and become familiar with all aspects of the site and existing conditions before submitting Contract price. No allowance will be made for lack of knowledge of existing conditions.

1.07 DEVIATIONS

A. No deviations from the Contract Documents shall be made without the full knowledge and written consent of the Architect.

B. If the existing conditions make it desirable to modify the Contract Documents in regard to any item, provide a written request to the Architect.

2.0 PRODUCTS

2.01 STANDARDS FOR MATERIALS AND WORKMANSHIP

A. All materials used shall be new and shall be stamped with the label of Underwriters Laboratories, Inc. (UL).

B. All materials shall meet the standards of the following associations and institutes where applicable:

1. National Fire Protection Association (NFPA)
2. American Society of Testing Materials (ASTM)
3. American National Standards Institute (ANSI)
4. National Electrical Manufacturer's Association (NEMA)
5. Institute of Electrical and Electronic Engineers (IEEE)

C. Manufacturer's names and catalog numbers specified herein are intended to describe the material and set the standard of quality. All buds shall be based on materials specified. Requests for approval of material not specified shall be considered if the request is in written form and submitted to the Architect no later than fourteen (14) days before bid date. All requests shall conform with the provisions of the general and supplementary conditions.

D. Samples of materials requested to be substituted shall be furnished upon the request of the Architect.

2.02 SHOP DRAWINGS AND SUBMITTAL

A. The Engineer's review of shop drawings or submittals is a cursory review to check for general compliances of submittals with the design intent of the Contract Documents. The Engineer's review does not relieve the Contractor of his responsibility of complying with the Contract Documents. All coordination of the work in strict compliance with the Contract Documents is the sole responsibility of the Contractor.

B. The following items shall be submitted for review:

1. Conduit and wire
2. Grounding System
3. Devices
4. Coverplates
5. Metering equipment
6. Panelboards
7. Fuses
8. Overcurrent Devices
9. Disconnect Switches
10. Lighting Fixtures
11. Life Safety Systems
12. Emergency system

C. All shop drawings and submittals shall be submitted in compliance with the requirements of the general and supplemental conditions. No more than four (4) copies of submittal data will be reviewed, Any additional copies will be returned unmarked. The responsibility of copying review comments on any additional copies will rest solely with the contractor.

D. All submittals shall bear the name of the manufacturer to be used.

E. All shop drawings and submittals shall include a stamped indication signifying that the submittal has been reviewed for compliance with the Contract Documents by the Contractor. The Stamped indication also represents the fact that the Contractor has checked this submittal for its interaction with all other Divisions and certifies by his signature or initials that all coordination has taken place. The stamp shall include the date, name of the Contracting Firm, the signature of the Contractor, certification of compliance and approval. The stamp shall be on the submittal before the Engineer will review it.

F. The Engineer will review an individual submittal not more than twice. If the submittal is rejected again on the second review, the contractor will bare all responsibility for paying for the Engineer's time for additional reviews. Such payments to the Engineer shall be withheld from the next monthly pay application.

2.03 RECORD (AS-BUILT) DRAWINGS AND MAINTENANCE MANUALS

A. At job completion, submit to the Architect, a set of prints (PDF and DWG) showing all deviations from the Contract Documents. The Drawings shall also have dimensions locating all underground conduits.

B. At job completion, submit to the Architect, three (3) sets of maintenance and instruction manuals for all equipment furnished on the project.

3.0 EXECUTION

3.01 COORDINATION

A. Coordinate all space requirements with all other Divisions before installing any work. Install work such that adequate space will be allotted for all other work from other Divisions to be installed and also will allow room for future access for repair and maintenance.

B. Any work installed without proper coordination shall be relocated at the Architect's direction without increasing the Contract price.

C. During the bidding process or the pricing for a guaranteed maximum price, coordinate with all other Divisions for the total amount of work required in Division 26. Any work shown or implied in another Division requiring work in Division 26 shall be included in the Contract price regardless of whether or not it is addressed in Division 26.

3.02 PROTECTION OF MATERIALS

A. All equipment shall have the original finish when the building is turned over to the Owner.

B. Protect equipment during construction from dirt, water, chemical, mechanical damage, etc. Protect all conduit openings so that no foreign materials will enter the conduit.

3.03 TEST, DEMONSTRATIONS AND INSTRUCTIONS

A. Test all systems described in this Division in the presence of the Owner or a designated representative upon completion of the work. Demonstrate that the installation is in accordance with Contract Documents.

B. Any work found not to be in compliance with the Contract Documents shall be repaired or replaced without incurring any additions to the Contract price.

C. Provide to the Owner, all instruction on maintenance and operations of all systems and equipment provided under this Division. Provide all necessary tools and personnel to thoroughly present these instructions.

3.02 GUARANTEE

A. All systems, equipment, components, work, etc. provided under this Division shall be covered by a one year guarantee starting at the time of final acceptance of the work by the Owner. Any defects in the work, systems, equipment or components found during this year shall be corrected at no charge. The guarantee shall include providing all necessary cutting, patchwork, repainting, etc. to make the work complete and new.

B. Present this guarantee and any additional warranties or guarantees on furnished equipment or systems to the Architect. All equipment or system guarantees are in addition to the general guarantee.

– END OF SECTION –

SECTION 261000
ELECTRICAL BASIC MATERIALS & METHODS

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in the Section shall comply with the provisions of Section 260100.

B. The Section describes the basic electrical materials and installation methods that are acceptable and applicable to Division 26.

2.0 PRODUCTS

2.01 CONDUIT

A. Galvanized rigid steel conduit shall be low carbon, hot-dipped galvanized both inside and out with threaded joints.

B. Intermediate metal conduit (IMC) shall be steel, galvanized both inside and out with threaded joints.

C. Electrical metallic tubing (EMT) shall be steel, galvanized both inside and out.

D. Plastic conduit (PVC) shall be schedule 40 PVC heavy wall type. A grounding conductor shall be provided.

E. Flexible metal conduit shall be flexible steel conduit tubing and shall meet Underwriters Laboratories Standard for Flexible Steel Conduit.

F. Liquid-tight flexible metal conduit and liquid-tight non-metallic conduits shall be liquid-tight and sunlight resistant.

G. Steel conduit approved manufacturers are Allied, Triangle and Republic.

H. PVC conduit approved manufacturers are Carlon and Tiangle.

2.02 CONDUIT FITTINGS

A. Rigid conduit and IMC conduit fittings shall be zinc-coated, ferrous metal and taper threaded type.

B. EMT fittings shall be zinc-coated steel and hexnut compression or set-screw type. EMT connectors shall have insulated throats.

C. PVC fittings, elbow and cement shall be produced by the same manufacturer. All joints shall be solvent welded in accordance with the manufacturer's recommendations.

D. Conduit connections to transformers, panel cabinets, and pull boxes shall have grounding wedge lugs between the bushing and the box or locknuts designed to bite into the metal.

E. Each conduit end shall be provided with either an insulated throat connector or separate locknut and insulated bushing. Bushing shall be installed before any wire is pulled.

F. Conduit fittings approved manufacturers are Raco, Steel City, O.Z. Gedney, Thomas & Betts and Appleton.

G. Expansion fittings shall be provided in all conduit which crosses an expansion joint.

2.03 CONDUCTORS

A. Conductors shall be copper of 98% conductivity, 600 volt insulation. Sizes specified are AWG gauge for No. 4/0 and smaller and circular mils (MCM) for all sizes larger than no. 4/0. Conductors No. 10 and smaller shall be solid and type "THHN" or "THWN" insulation. No. 8 and larger shall be stranded and type "THW" or "XHHW" insulation.

2.04 OUTLETS

A. Outlet boxes and covers shall be of such form and dimensions as to be adapted to their specified usage, locations, size and quantity of conduit, and size and quantity of conductors entering the boxes. In special "Fire Rated" partitions, outlets shall comply with ASTM No. E119.

B. Flush ceiling outlets for surface or pendant mounted lighting fixtures shall be one-piece 4" square or octagonal pressed steel boxes. Boxes for devices in unfinished masonry walls or stud walls shall be pressed steel, square corner, sectional switch boxes, or shall be 4" square box with a square cornered tile wall cover, set flush with masonry construction. Boxes in concrete ceiling slab shall be octagonal, shallow concrete boxes. Welded boxes are not acceptable.

C. All outlet boxes in plaster or masonry walls or ceiling shall be provided with plaster rings.

D. Junction boxes and all outlets not indicated as containing wiring devices or lighting fixtures shall have covers. Covers for outlets in walls shall be as specified for wall switches and receptacles.

E. Outlet boxes exposed to the weather shall be of cast iron corrosion resistant type.

F. Outlet box approved manufacturers are Appleton, Raco, Steel City or Crouse-Hinds.

2.05 DISCONNECT SWITCHES

A. Disconnect switches shall be "heavy-duty" type, enclosed switches of quick-make, quick-break construction. Switches shall be horsepower rated for 600 volts AC as required. Lugs shall be UL listed for copper and aluminum.

B. Padlocking provisions shall be provided for padlocking in the OFF position.

C. Switches shall be furnished in NEMA 1 General purpose enclosure unless noted otherwise. Switches located on the exterior of the building or in "wet" locations shall have NEMA 3R enclosures.

D. Disconnect switches shall be mounted to structure. Disconnect switches shall not be mounted to mechanical equipment or ductwork.

E. Fused disconnect switches shall have rejection type fuse clips with dual element, current limiting fuses of rating shown.

2.06 NAMEPLATES

A. Nameplates shall have 3/8" high engraved letters.

B. 120, 208, or 240 volts: white core laminated bakelite with black finish.

C. Nameplate shall indicate the panel name and the name of the device or equipment where the power supply/feeder originates.

2.07 WALL SWITCHES

A. Wall switches shall be plastic, totally enclosed, quiet type, self-grounding, 120 volt and 20A rating and shall match existing.

B. Color shall be as selected by architect.

2.08 RECEPTACLES

A. Duplex receptacles shall be plastic, two-pole, three wire, self-grounding, side wired, 125 volts and 15A rating and shall match existing.

B. Dedicated receptacles shall be plastic, two-pole, three wire, self-grounding, side wired, 125 volts and 20A rating and shall match existing.

C. Ground fault circuit interrupt (GFCI) receptacles shall be provided in accordance with NEC 210.8(B) and shall match existing.

D. Color of all other receptacles shall be as selected by the Architect.

2.09 COVERPLATES

A. Coverplates for flush mounted devices shall be brushed finished stainless steel standard size, Hubbell "P" Series or equal by Leviton, P&S, or Cooper.

B. Coverplates for exterior devices shall be self-closing, die-cast aluminum Hubbell WP8M or equal by Leviton, P&S, or Cooper.

2.10 SMOKE AND FIRE STOP FITTINGS

A. Smoke and Fire Stop Fittings shall be UL listed for that purpose. The fittings used to seal conduit either on the outside of the conduit, busway or cable or internally shall have heat activated intumescent material, which expands to fill all voids. Smoke and fire stop fittings shall be O.Z./Gedney "FIRE-SEAL" or Dow Corning silicone RTV foam with an hourly fire-rating equal to or higher than the rating of the floor, ceiling or wall through which the cable or conduit passes. The seals for conduit shall be of the flanged type.

2.11 FUSES

A. Provide all fuses. All fuses shall be of the same manufacturer. All fuses shall be of the high interrupting rating (200,000 Amps), current limiting type and manufactured by Bussmann. Fuses shall be provided for each fuse cutout and the specified quantity of fuses shall be furnished for spares.

B. Circuits 0 to 600 ampere shall be protected by rejection type, current limiting BUSSMANN LOWPEAK Dual Element Fuses LPN-RK (250 volts). All dual-element fuses shall have separate overload and short-circuit clearing chamber. The fuse must hold 500% of rated current for a minimum of 10 seconds and be listed by Underwriter's Laboratories, Inc., with an interrupting rating of 200,000 amperes RMS symmetrical. The fuses shall be UL Class RK-1.

C. Furnish and turn over to the Owner/Tenatn a minimum of one (1) set of spare fuses (set consisting of three fuses) for each type and rating of fuse used. When the number of fuse sets of the same type and rating actually installed exceeds five (5) sets, furnish an additional spare set of fuses for each five (5) or fraction thereof.

D. Acceptable manufacturers are Bussman or equal by Littlefuse.

3.0 EXECUTION

3.01 CONDUIT

A. Rigid steel (or IMC) shall be used for service entrance and all feeders and branch circuit where exposed to damage.

B. EMT shall be used for branch circuits, fire alarm and telephone when not underground or in concrete in contact with the earth.

C. Schedule 40 PVC may be used for all underground feeders, service entrance conductors when encased in 4" of concrete on all sides, or under the lowest floor slab.

D. Conduit shall be continuous from outlet to outlet, from outlet to cabinet, junction box and pull box. Conduit shall enter and be secured to all boxes, etc., in such a manner that each system will be electrically continuous from service to all outlets such that a good ground is provided. All conduit from cabinets and junction boxes or conduit fittings. Conduit connections to any box with has no threaded hub shall be doubled locknutted.

E. Provide junction boxes or pull boxes where shown and where necessary to avoid excessive runs or too many bends between outlets. The conduit sizes shown may increase if desired to facilitate the pulling of cables.

F. All conduit shall be concealed unless indicated otherwise. Install exposed conduit parallel with or at right angles to the building walls and support from walls or ceilings at intervals required by Code with approved galvanized iron clamps or hangers. Concealed conduit above the ceiling shall be supported independent of ceiling construction. Where ceilings of lay-in type are used, conduit must be installed high enough to permit removal of ceiling panels and lighting fixtures. Use threaded roods and hangers for supporting single conduit. Use trapeze hangers consisting of double-nutted threaded rods and "Unistrut" channels or angles of 12 gauge minimum steel for supporting multiple conduit.

G. Minimum size conduit for branch circuits shall not be smaller than 1/2". Home runs sahll extend from outlets shown to panel designated. Home runs shown shall not be combined. Home run conduit shall not be smaller than 3/4" conduit.

H. At couplings, conduit ends shall be threaded so that they meet in the coupling. Right and left hand couplings shall not be used; conduit couplings of the Erikson Type shall be used at locations requiring such joints.

I. All conduits for future use, for telephone wire, or for data communication cable, shall be left with No. 16 gauge wire pulled in them or a pull line as manufactured by Ideal, and the ends securely corked or capped.

J. Expansion fitting shall be installed in all conduit which pass through the cross-sectional area of expansion joints.

K. Provide non-hardening elastic type duct seal compound, Neer No. DC., 3M Co. "Scotchfil", or Gardner Bender duct seal, for each conduit entering the building from outside and for each conduit passing through one space into another which is normally at a lower temperature.

L. Space in sleeves or around conduit that pass through fire resistive or fire rated walls, partitions, floors, or ceiling shall be closed by packing with an unlabelled fire resistive material that will maintain the fire rating of the barrier penetrated.

3.02 FLEXIBLE CONDUIT

A. PVS extruded flexible conduit shall be used in making short flexible connections to rotating or vibrating machinery or equipment. The flexible conduit at these locations shall be as short as possible, but shall have a minimum length of 12".

B. A green stranded bonding jumper shall be installed outside of all flexible conduit that extends directly from a non-flex conduit to a rotating or vibrating machine. Where a junction box is used, the green stranded bonding jumper shall be installed inside the flexible conduit and attached to the junction box and to the machine. When the bonding jumper is installed outside of the flexible conduit, plastic wire straps shall be used 6" o.c. to secure the jumper to the flexible conduit.

3.03 CONDUIT PROTECTION

A. Conduit shall be secured in place and protected where necessary to prevent damage to work during construction. The ends of all conduit shall be plugged to avoid filling with any foreign matter. All conduit shall be blown out and swabbed clear of water and trash prior to pulling wire.

3.04 WIRING

A. All conductors shall be installed in conduit. No conductors shall be pulled into the conduit until the conduit system is complete and plaster had dried. Wire pulling lubricants shall be Gardner-Bender "Wireaide" or Ideal "Yellow 77".

B. Conductors shall be continuous from outlet to outlet and from outlet to junction box or pull box. All splices and joints shall be carefully and securely made to be mechanically and electrically solid with pressure type connectors, Gardner Bender "Wingard" or Ideal "Wingnut". Tape shall be "Scotch" No. 33 for indoor and No. 88 for outdoor or Gardner Bender No. 95-661. Where connection is made to any terminals of more than 30 amperes capacity and where conductors larger than No. 10 are connected to any terminal, copper terminal lugs shall be bolted to the conductors. Where multiple connections are made to the same terminal, individual lugs for each conductor shall be used.

C. Each conduit shall have a minimum of two (2) conductors, plus ground, pulled in unless that particular conduit is noted as being for systems other than electrical circuitry and/or future use or unless noted otherwise.

D. Conductors for lighting and receptacle circuits shall have color coded jackets. The wiring shall be color coded with the same color used with its respective phase through the entire job as follows:

208/120 Volt System	240/120 Volt System
Phase A – Black	Phase A – Black
Phase B – Red	Phase B – Red
Phase C – Blue	Neutral – White
Neutral – White	Ground – Green
Ground – Green	

E. The feeder and service entrance conductors shall be color coded by the use of colored plastic tape applied within 6" of each conductor end.

F. Branch circuit conductors shall not be smaller than No. 12 and where the home run from center of load exceeds 100'-0", the conductors from home run outlet to panel shall be No. 10 minimum.

G. For branch circuits terminating in outlet without device, leave minimum of 12" of slack wire coiled for connection of equipment. All conductors shall be identified with proper circuit numbers at terminals, junction boxes at panelboards within 6" of conductor ends.

3.05 OUTLETS

A. Provide galvanized steel or cast type boxes for all outlets.

B. Where outlet boxes are used to support lighting fixtures, the outlet box shall be anchored to the structural members of the building per NEC 370.13.

C. Outlet boxes shall be flush mounted unless they are specifically shown as being used with exposed conduit or are located above a ceiling.

D. Where outlets are supplied from conduit run in or below floor slabs, the conduit shall be stubbed up at the location shown and the wall built up around the conduit.

E. Cuts for outlet boxes in masonry walls shall be made so that the coverplate will completely cover the cut. The mounting height of switch, receptacle and other outlets may be varied slightly, with the Architect's approvals, so that the outlet box, top or bottom, will occur at a masonry joint.

F. The edge of all outlet boxes shall be flush with the surface in which they are recessed. The devices that fit into the outlet boxes shall be screwed tight before the coverplate is installed and the coverplate shall not be used as a means of tightening the devices in place.

G. Where outlets are shown as being adjacent and different mounting heights are specified for each, they shall be mounted one directly over the other, on the centerline of the group.

3.06 NAMEPLATES

A. Provide specified nameplates on the panelboards, disconnect switches, and motor switches.

B. Nameplates for surface mounted equipment shall be installed on the exterior of equipment with sheetmetal screws. Nameplates for flush or recessed mounted equipment shall be installed on the inside of the panel door or cover with epoxy cement.

3.07 WALL SWITCHES AND RECEPTACLES

A. Where more than one device is indicated at a location, the devices shall be gang-mounted in combined multi-gang boxes and covered jointly by a common coverplate. Provide barriers as required by the devices and voltages being used.

3.08 COVERPLATES

A. All junction boxes, outlet boxes, multi-gang switch boxes, utility boxes, etc., shall be covered with a coverplate. The coverplate shall be a finished plate as specified unless designated otherwise.

B. Coverplates shall be mounted vertically unless designated otherwise

3.09 GROUNDING

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION

CONSULTANTS

BW&A
Barrett,Woodyard & Associates, Inc.
3495 Holcomb Bridge Road
Norcross, GA 30092
Phone (770) 810-8800
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BW&A Job No. 2024-1102

JDG Jaredian Design Group
Architects, Engineers and Construction Managers
5143 Palm Passage,
Second Floor - Suites B24-25 St. Thomas,
US Virgin Islands 00802
Post Office Box 6218
St. Thomas, U.S. Virgin Islands 00804-6218
telephone: 340.777.1600
e-mail: jarediandesigngroup@gmail.com
website: www.jarediandesigngroup.com

ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN
ISLANDS

DATE: 03.14.2025
DRAWN BY: L. ORTIZ
CHECKED BY: J. CLARK
APPROVED BY: J. CLARK

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: E0.4

ELECTRICAL SPECIFICATIONS

PROFESSIONAL ENGINEER
JASON CLARK
0-50990-181
U.S. VIRGIN ISLANDS

A. Ground connections shall be in accordance with the 2020 National Electrical Code. All ground connections in the building system ground shall be done with Cadweld.

B. Existing main grounding electrode ground bar shall be bonded to a new grounding electrode system consisting of a minimum of three (3) copperweld ground rods, 3/4" x 10'-0", driven 24" below grade a minimum of 72" apart in the form on an equilateral triangle, bonded together with No. 3/0 conductors. Install rods a minimum of 36" clear of foundation walls to effect the building ground. If the resistance to ground exceeds 25 ohms, additional rods shall be driven and bonded together until a reading of 25 ohms or less is obtained. After completion of the grounding system, measure the system ground resistance with a "Megger Earth Tester". Submit directly to the Architect two (2) copies of each test report certified by the testing technician and the Owner's representative.

C. The existing main ground bar shall be part of the grounding electrode system and shall be in compliant with Article 250 of the NEC. Field verify that the systems connected to the main ground bar and making up with grounding electrode system is in compliant with Part III, Article 250 of the NEC.

D. Extend from the existing main grounding electrode ground bar to the main service disconnect with copper insulated ground conductor (size as indicated on drawings) in a 1" conduit and connect to the neutral bar, housing and frame.

E. All steel conduit entering the main service disconnect shall have threaded conduit insulated grounding bushings. All bushings shall be bonded together and bonded to the main ground bus with a No. 4 bare conductor.

F. Provide an insulated green bonding jumper from the grounding lug of all receptacles to Steel City "GEE" clip or sheet metal screw in the outlet box. The grounding wire installed behind the device mounting screw will not be acceptable

3.10 CONNECTION TO EQUIPMENT

A. Equipment furnished by the Owner or under other Sections, such as mechanical equipment, elevators, escalators, signs, kitchen equipment, etc., will be installed by others. Provide electrical service and make the electrical circuit connection to this equipment.

B. Provide PVC insulated flexible cord sets for all cord and plug connected building appliances and equipment. Cords shall be sized in accordance with electrical circuits indicated. Multiple conductor cords shall be "SO" cable with PVC jacket and green insulated ground conductor.

3.11 CORING, CUTTING AND PATCHING

A. Set sleeves for conduit accurately before the concrete floors are poured, or set boxes on the forms so as to leave openings in the floors in which the required sleeves can be subsequently located. Fill in the voids around the sleeves with concrete.

B. Should the performance of this preliminary work be neglected and should cutting be required in order to install conduit, then the expense of the cutting and restoring of surfaces to their original conditions shall be accomplished without incurring additions to the Contract.

3.12 EQUIPMENT ANCHORING

A. All items of electrical equipment, such as switchboards, motor control centers, transformers, standby generator, etc., shall be securely anchored to the building structure. The anchoring shall be accomplished by utilizing a minimum size of 3/8" steel anchor bolts in the structure and to the item of equipment. A minimum of two (2) anchor bolts shall be provided on each side of each item of equipment with the following exceptions:

Exception No. 1: If the equipment manufacturer includes more than two (2) anchor holes per side in the base or base frame of the equipment item, then there shall be one anchor for each anchor hole.

Exception No. 2: If the equipment manufacturer recommends a particular quantity greater than two (2) per side, then that quantity of anchors shall be provided.

– END OF SECTION –

SECTION 262000
SERVICE AND DISTRIBUTION

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section shall comply with the provisions of Section 26 01 00.

B. Provide a complete electrical distribution system. The system shall include the service entrance, main switchboard, feeders, transformers, distribution panels, panelboards, busway, remote control switches, contactors, etc., to provide a complete system.

C. All distribution switchgear (branch circuit panelboards, switchboard, distribution panelboards, transformers, busway, etc.) shall be the unit responsibility of one manufacturer. All component parts of the above listed items shall be of the same manufacturer except where a written request for deviation from this requirement has been approved prior to bid date.

D. Shop drawings for equipment specified in this Section shall show that all specified requirements have been incorporated.

E. Coordination studies shall be done prior to shop drawing submittals. Shop drawings shall include all breakers that meet the coordination study. If study is performed after the shop drawings are submitted, any revisions to breakers or panels shall be at no additional cost to the project.

F. All floor mounted distribution equipment shall be mounted on a 4" high concrete pad.

1.01 ELECTRICAL SERVICE

A. Make all arrangements with the power company and pay all charges made by the power company for permanent electric service. In the event that the power company's charges are not available at the time the project is bid, the bids shall be qualified to notify the Owner that such charges are not included.

B. The power company will provide the secondary conductors, overhead from the pole terminating at the weatherhead, and the connection of the overhead conductors to the service conductors.

C. Provide the insulated terminals for the overhead conductors, the weatherhead(s), and the conduit and wire for the service entrance, terminating at the main switchboard.

D. The secondary service to the FAP Type A building shall be 120/208 volts, 3 phase, 4 wire, 60 Hertz AC. The secondary service to the FAP Type B and C building shall be 120/240 volts, 1 phase, 3 wire, 60 Hertz AC.

1.02 METERING

A. Provide a 1" conduit with a weather-head from the point of attachment of the service conductors to the meter base.

B. When required by Power Company, provide the current transformers cabinet and a 1" conduit with fish-wire to the meter base. Install all equipment as directed by the Power Company.

2.0 PRODUCTS

2.01 BRANCH CIRCUIT PANELBOARDS

A. Panelboards (panels) shall be general purpose enclosures and shall be surface or flush mounted as indicated. Panels shall be of the automatic circuit breaker type, factory assembled by the manufacturer of the circuit breakers. Panels shall be for the voltage indicated with the quantity of poles and ampacity of circuit breakers shown.

B. Boxes and trim shall be made from code gauge steel. Boxes shall be sufficient size to provide a minimum gutter space of 4" on all sides. Boxes shall be minimum 20" width and 5 3/4" depth.

C. Hinged door covering all device handles shall be included in all panel trim. Doors shall have flush-type cylinder lock and catch, except that doors over 48" in height shall have auxiliary fasteners at top and bottom of door in addition to flush-type cylinder lock and catch. Door hinges shall be concealed. All locks shall be keyed alike. Directory frame and card having a transparent cover shall be furnished each panel door.

D. Trims for flush panels shall overlap the box by at least 3/4" all around. Surface trims shall have the same width and height as the box. Trims shall be mountable by a screwdriver without the need for special tools. After installation, trim mounting mechanism or hardware shall not be accessible when panel door is closed and locked.

E. All exterior and interior steel surfaces of the trim shall be cleaned and finished with gray paint over a rust-inhibiting phosphatized coating.

F. All interiors shall be completely factory assembled with protective devices, wire connectors, etc. All wire connectors, except screw terminals, shall be of the anti-turn solderless type and all shall be suitable for copper or aluminum wire.

G. Interiors shall be so designed that devices can be replaced without disturbing adjacent units and without removing the main bus connectors, and shall be so designed that devices may be changed without machining, drilling or tapping.

H. Bus bars for the mains shall be of copper sized in accordance with U.L. standards. Full size bars shall be included. Bus bar taps for panels with single pole branches shall be arranged for sequence phasing of the branch circuit devices.

I. Phase bussing shall be full height without reduction. Cross and center connectors shall be of the same material as the bus.

J. The neutral bus shall utilize setscrews to bond the neutral wire to the neutral bus through holes drilled in the neutral bar. A sheet copper neutral bus utilizing flathead screws to hold the neutral wires will not be acceptable.

K. Spaces for future devices shall be included as indicated and shall be bussed for the maximum rated device that can be fitted into them.

L. All circuit breakers shall be manually operated, thermal-magnetic, automatic, of the ampacity and poles as indicated. They shall be quick-make, quick-break, both on manual and automatic operation. Breakers shall be over-the-center toggle operating type, with the handle going to a position between ON and OFF to indicate automatic tripping. All multi-pole breakers shall have internal common trip. The minimum interrupting capacity of the breakers furnished shall be 10,000 amperes RMS symmetrical for 120/208 volt and 14,000 amperes RMS symmetrical for 480/277 volt unless indicated otherwise on the riser diagram. The breakers furnished shall be determined by the specifications and by the minimum U.L. labeled RMS symmetrical amperes interrupting capacity at circuit voltage. All circuit breakers shall be bolted on and rigidly braced.

M. Panels having sub-feed lugs for feeding through shall have 8" minimum extra gutter space at the lug end and on one side.

N. Each panel as a complete unit shall have a short-circuit current rating equal to or greater than the equipment rating indicated.

O. All circuit breakers serving the fire alarm system shall include red marking and a listed locking mechanism per NFPA 72.

P. Panels shall match existing.

3.0 EXECUTION

3.01 INSTALLATION

A. Provide a typewritten directory under plastic for all panelboards with spares marked in pencil. Circuit identification shall include sufficient detail to allow each circuit to be distinguished from all others. Include specific tenant suite numbers in multi-tenant buildings in the circuit description. Provide a label on each breaker in a switchboard or distribution panelboard with the same level of circuit identification details.

B. Provide all necessary hardware to level and secure the switchgear as required by the manufacturer's instructions. Make all electrical connections for supply and load circuits and leave in operating condition.

C. Clean enclosure of all switchgear of all foreign matter, including dust.

D. Remove all rust marks and repaint to leave switchgear in new condition.

3.02 STUDIES

A. As a requirement for the project documents to be delivered by the contractor, provide a complete short circuit and selective coordination study from the service entrance to all end devices. The study shall be provided by the switchgear manufacturer or their vendor and shall utilize time current curves that are developed by the gear manufacturer selected for use in the building. The study shall be made available for review by the engineer and local code enforcement authorities no later than at the times they deem necessary for certificates of occupancy to be issued. Obtain critical dates from the inspections department of the local code enforcement department during the inspection process to determine when presentation of the selective coordination study to the inspections department is necessary for timely issuance of the certificate of occupancy.

B. The minimum project requirement described in A. above shall not be scaled back to the minimum NEC code requirement unless agreed to by all parties associated with the construction of the project including, but not limited to, the owner, architect, engineer, developer, etc.

– END OF SECTION –

SECTION 266100
EMERGENCY SYSTEM

1.0 GENERAL

1.01 DESCRIPTION

A. Provide all labor and materials necessary to install a standby diesel engine-generator set onto a concrete generator pad.

B. Additional major equipment such as the automatic transfer switch, exterior temporary generator connection cabinets, and remote fuel fill station shall be provided.

C. The engine-generator set shall be suitable for indoor use.

D. Codes and Standards:
1. The generator set shall be listed to UL 2200 or submitted to an independent third party certification process to verify compliance as installed.
2. The generator set shall conform to the requirements of the following codes and standards:
a. CSA C22.2, No. 14-M91 Industrial Control Equipment.
b. EN50082-2, Electromagnetic Compatibility-Generic Immunity Requirements, Part 2: Industrial.
c. EN55011, Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific and Medical Equipment.
d. IEC8528 part 4, Control Systems for Generator Sets.
e. IEC Std 61000-2 and 61000-3 for susceptibility, 61000-6 radiated and conducted electromagnetic emissions.
f. IEEE446 Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.
g. NFPA 70, National Electrical Code, Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.
h. NFPA 99, Essential Electrical Systems for Health Care Facilities.
i. NFPA 110, Emergency and Standby Power Systems.

1.02 SUBMITTALS

A. Furnish information showing manufacturers' model numbers, dimensions and weights for the engine, generator and major auxiliary equipment.

B. Submit copies of pertinent drawings and schematic diagrams for approval and include the following:
1. Engine generator set including plans and elevations clearly indicating entrance points for each of the interconnections required.
2. Engine generator/exciter control cubicle.
3. Fuel consumption rate at various loads, ventilation and combustion CFM requirements.
4. Exhaust mufflers
5. Battery charger, battery and battery racks.
6. Automatic load transfer control switch.
7. Actual electrical diagrams including schematic diagrams and inter-connection wiring diagrams for all equipment to be provided.
8. Legends for all devices on all diagrams.
9. Vibration isolators with minimum 95% efficiency (provide calculations)
10. Fuel connection points
11. Automatic regen power absorption control
12. Generator control panel and remote annunciator panel

C. The specified Standby / Prime KW shall be for continuous electrical service during interruption of the normal utility source and shall be certified by the manufacturer for the actual unit supplied.

2.0 PRODUCTS

2.01 MANUFACTURER

A. The basis of design shall be a Cummins.

B. Motor starting performance and voltage dip determinations shall be based on the complete generator set. With a maximum instantaneous voltage dip of 35%, as measured by a digital RMS transient recorder in accordance with IEEE standard 115. Motor starting performance and voltage dip determination that does not account for all components affecting total voltage dip i.e. engine, alternator, voltage regulator and governor will not be acceptable. As such, the generator set shall be prototype tested to optimize and determine performance as a generator set system.

2.02 ENGINE

A. The engine shall be governed at a speed of 1800 rpm, and shall be equipped with the following:
1. Electronic isochronous governor capable of 0.25% steady-state frequency regulation.
2. 24-volt positive-engagement solenoid shift-starting motor.
3. 30-ampere automatic battery charging alternator with a solid-state voltage regulation.
4. Positive displacement, full-pressure lubrication oil pump, cartridge oil filters, dipstick, and oil drain.
5. Dry-type replaceable air cleaner elements for normal applications.
6. Engine-driven or electric fuel-transfer pump including fuel filter and electric solenoid fuel shutoff valve capable of lifting fuel.

B. The turbocharged engine shall be fueled by diesel.

C. The engine shall be liquid-cooled by Unit Mounted Radiator 122°F/50°C.

D. The engine shall be EPA certified from the factory.

2.03 ALTERNATOR

A. The alternator shall be salient-pole, brushless, 2/3-pitch, 10 lead, self-ventilated with drip-proof construction and amortisseur rotor windings and skewed for smooth voltage waveform. The ratings shall meet the NEMA standard (MG1-32.40) temperature rise limits. The insulation shall be class H per UL1446 and the varnish shall be a fungus resistant epoxy. Temperature rise of the rotor and stator shall be limited to Standby 130°C. The excitation system shall be of brushless construction controlled by a solid-state voltage regulator capable of maintaining voltage within ±.25%% at any constant load from 0% to 100% of rating. The AVR shall be capable of proper operation under severe nonlinear loads and provide individual adjustments for voltage range, stability and volts-per-hertz operations. The AVR shall be protected from the environment by conformal coating. The waveform harmonic distortion shall not exceed 5% total RMS measured line-to-line at full rated load. The TIF factor shall not exceed 50.

B. The alternator shall have a single maintenance-free bearing, designed for 40000 hour B10 life. The alternator shall be directly connected to the flywheel housing with a semi-flexible coupling between the rotor and the flywheel.

C. The generator shall be inherently capable of sustaining at least 300% of rated current for at least 10 seconds under a 3-phase symmetrical short circuit without the addition of separate current-support devices.

2.04 GENERATOR

A. The generator shall be as follows:

1. The generator shall be rated for continuous standby and prime service as indicated on drawings with a 0.8 power factor, 208/120 volts, three-phase, four wire, 60 hertz, 1800 RPM.
2. The generator shall be a three phase, 60 hertz, single bearing, rotating field, synchronous type built to NEMA standards. A voltage regulator shall be provided to match the characteristics of the generator and engine. Voltage regulation shall be +/- 2% from no load to full rated load. Readily accessible voltage-droop, voltage level and voltage gain controls shall be provided. Voltage level adjustment shall be a minimum of +/- 5%. Generator and exciter shall be inherently capable of parallel operation with other power sources of equivalent electrical characteristics, and stator shall include a twelve lead, reconnectable bus system for each load reconnection. Generator shall be brushless permanent magnet, and shall sustain short circuit current at 300% of rated current up to 10 seconds. The generator must accept rated load in one-step. Generator performance shall comply with ISO-8528-5, Class G3.

2.05 COOLING SYSTEM

A. A radiator with blower type fan shall be provided to maintain safe operation at 110 degrees F. ambient temperature. Radiator shall allow an additional 0.5" H20 restriction without any derating. Provide ductwork with flexible connecting section between radiator and discharge louver frame. Provide an engine coolant heater with thermostat to maintain coolant temperature at not lower than 60 degrees F. Heater shall operate at a variable voltage range between 120-240 VAC. Heater shall have an oil pressure disconnect to turn heater off when engine is operating.

B. The engine cooling system shall be pretreated by the system supplier for the inhibition of internal corrosion and freezing.

2.06 DOUBLE WALL SECONDARY CONTAINMENT SUB BASE FUEL TANK

A. A sub-base fuel tank used in conjunction with a diesel powered generator set will support the generator set for a period of 48 hours at 100% rated load. Fuel tank shall be installed to maintain a minimum 3 feet of clearance on all sides per NFPA 110 and to maintain all equipment clearances per NEC 110.26. Clearance must account for any other equipment in the room. Adjust the exact location as required.

B. The sub-base fuel system is listed under UL 142, subsection entitled Special Purpose Tanks EFVT category, and will bear their mark of UL Approval according to their particular classification.

C. The above ground steel secondary containment rectangular tank for use as a sub base for diesel generators is manufactured and intended to be installed in accordance with the Flammable and Combustible Liquids Code--NFPA 30, the Standard for Installation and Use of Stationary Combustible Engine and Gas Turbines--NFPA 37, and Emergency and Standby Power Systems--NFPA 110.

D. Primary Tank. It will be rectangular in shape and constructed in clam shell fashion to ensure maximum structural integrity and allow the use of a full throat fillet weld.

1. Steel Channel Support System. Reinforced steel box channel for generator support, with a load rating of 5,000 lbs. per generator mounting hole location. Full height gussets at either end of channel and at generator mounting holes shall be utilized.
2. Exterior Finish. The exterior coating has been tested to withstand continuous salt spray testing for 1000 hours per ASTM B-117 and tested for chemical resistance per ASTM D 5402.

E. Venting. Normal venting shall be sized in accordance with the American Petroleum Institute Standard No 2000, Venting Atmospheric and Low Pressure Storage Tanks not less than 1-1/4" (3 cm.) nominal inside diameter.

F. Emergency Venting. The emergency vent opening shall be sized to accommodate the total capacity of both normal and emergency venting and shall be not less than that derived from NFPA 30, table 2-8, and based on the wetted surface area of the tank. The wetted area of the tank shall be calculated on the basis of 100 percent of the primary tank. The vent is spring-pressure operated: opening pressure is 0.5/psig and full opening pressure is 2.5 psig. The emergency relief vent is sized to accommodate the total venting capacity of both normal and emergency vents.

G. Fuel Fill. There shall be a 2" NPT opening within the primary tank and lockable manual fill cap. Provide with static fill tube and spill containment bucket.

H. Fuel Level. A direct reading, UL listed, magnetic fuel level gauge with a hermetically sealed vacuum tested dial shall be provided to eliminate fogging. Provide with high fuel level alarm set at 90% with annunciation at the generator and remote annunciator panel. Provide overfill prevention valve (OPV) set at 95%.

I. Low Fuel Level Switch. Consists of a 30 watt float switch for remote or local annunciation of a (50% standard) low fuel level condition.

J. Provide any provisions required for remote fuel station and its associated piping.

2.07 INDOOR UNIT EXHAUST SYSTEM

A. A super critical, internally insulated, hockey puck type silencer with mounting tabs, companion flanges and flexible stainless steel exhaust fittings shall be provided according to the manufacturer's recommendations. Mounting shall be supported by building structure. The silencer shall be mounted so that its weight is not supported by the engine. Exhaust system including silencer and pipe size shall be sufficient to ensure that exhaust back-pressure does not exceed the maximum limitations specified by the engine manufacturer.

B. The muffler and all indoor exhaust piping shall be lagged to maintain a surface temperature not to exceed 150 degrees F. The insulation shall be installed so that it does not cover or interfere with the functioning of the flexible exhaust fitting. Insulation shall be supplied under Division 23.

2.08 AUTOMATIC STARTING SYSTEM

A. A DC electric starting system with positive engagement shall be provided. The motor voltage shall be as recommended by the engine manufacturer.

B. Fully automatic generator set start-stop controls in the generator control panel shall be provided. Controls shall provide shutdown for low oil pressure, high water temperature, over-speed and over-crank. Controls shall allow for 3 cranking cycles before over-crank alarm or lockout. Each cycle should engage the crank for 15 seconds and allow for 15 second cool-down before reattempting next cranking cycle.

C. A belt driven battery charging alternator shall be provided with transistorized voltage regulator. Voltage shall match the electric starting system.

D. A lead-acid storage battery set of the heavy duty starting type shall be provided. Battery voltage shall be compatible with the starting system. The battery set shall be rated as required by generator manufacturer in amp hours. Necessary cables and clamps shall be provided. Batteries, starting system, and charger should be sized in accordance with NFPA Level 1 requirements listed in NFPA 110 5.6.4*.

E. Battery racks shall be provided for each battery and shall conform to NEC 480-7,a,1. They shall be constructed of metal and so treated as to be resistant to deteriorating action by battery electrolyte. Further, construction shall be such that non-conducting insulation material directly supports the cells.

F. A current limiting battery charger shall be provided to automatically recharge batteries. It shall include overload protection, silicon diode full wave rectifiers, voltage surge suppressor, DC ammeter, DC voltmeter, equalize timer and fused AC input. AC input voltage shall be 120 volts, single phase. Amperage output shall be no less than 10 amperes. Alarm shall be provided for low-battery voltage and battery charger fault in the charger. Control circuit shall be wired from charger to generator control panel by electrical contractor for indication on control panel. Obtain power for battery charger from base building panel in core (HH or L as necessitated by voltage required).

2.09 GENERATOR CONTROL PANEL

A. The generator set controller shall be a microprocessor based control system that will provide automatic starting, system monitoring, and protection. The controller system shall also provide local monitoring and remote monitoring. The control system shall be capable of PC based updating of all necessary parameters, firmware, and software. The controller shall be mounted on the generator set and shall have integral vibration isolation. The controller shall be prototype and reliability tested to ensure operation in the conditions encountered.

Controller shall meet NFPA 110 Level 1 requirements and include an integral alarms per NFPA. The controller should meet NFPA 99 and NEC requirements. The controller should be UL 508 certified.The controller shall functionally allow for adjusting start time delays, provide output for load shedding, programmable exercise settings, integral alternator overload protection, voltage and frequency adjustment, integral microprocessor based three phase RMS sensing and voltage regulation. All settings shall be adjustable via PC. Provide outputs for remote alarm monitoring per NFPA 110 Level 1. The controller registries should be accessible via Modbus RTU. The controller shall provide common failure relays to signal fault/and or shutdown conditions.

Control panel function shall include, but shall not be limited to, the following:
1. Frequency Meter
2. Voltmeter, 2% accuracy.
3. Ammeter, 2% accuracy.
4. Ammeter/Voltmeter phase selector switch.
5. Automatic starting controls as specified.
6. Voltage level adjustment.
7. Contacts for remote alarms wired to terminal strips.
8. Individual fault indicator lights for low oil pressure, high water temperature, over-speed, over-crank and low water temperature.
9. Three position function switch marked, RUN-STOP and REMOTE.
10. Running time meter, oil pressure, battery charging ammeter and water temperature gauges.

B. Remote Annunciator Panel. A remote annunciator shall meet all NFPA 110, Level 1 requirements and enable remote viewing of the generator status and include automatic transfer switch control. The panel shall be connected to the generator controller via either network communication wires or via hard wired connections. Options shall be available to provide ATS source position, loaded test, and retransfer. The panel shall have the capability to be either flush- mounted or surface-mounted. The annunciator shall meet UL508 requirements.

2.10 MAIN LINE CIRCUIT BREAKERS

A. Provide main-line, molded case circuit breakers mounted upon the generator. The outputs of the generator shall be protected by lood circuit interrupting and protection devices. They shall operate both manually for normal switching functions and automatically during overload and short-circuit conditions.

B. The trip unit for each pole shall have elements providing inverse time delay during overload conditions and instantaneous magnetic tripping for short circuit protection. The circuit breaker shall meet standards as established by U.L., NEMA and the N.E.C.

2.11 AUTOMATIC LOAD TRANSFER SWITCH

A. Furnish and install automatic transfer switches system(s) with 4 Pole - Switched Neutral 208 volt, amperage as shown. The Automatic transfer shall consist of an inherently double throw power transfer switch mechanism and a microprocessor controller to provide automatic operation. The transfer switch and controllers shall be the products of the same manufacturer.

2.12 CODES AND STANDARDS - The automatic transfer switches and controls shall conform to the requirements of:

A. UL 1008 - Standard for Transfer Switch Equipment

B. IEC 947-6-1 Low-voltage Switchgear and Control gear; Multifunction equipment; Automatic Transfer Switching Equipment

C. NFPA 70 - National Electrical Code

D. NFPA 99 - Essential Electrical Systems for Health Care Facilities

E. NFPA 110 - Emergency and Standby Power Systems

F. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications

G. NEMA Standard ICS10-1993 (formerly ICS2-447) - AC Automatic Transfer Switches

H. UL 508 Industrial Control Equipment

I. CSA C22.2 No. 178 certification

2.13 ACCEPTABLE MANUFACTURERS

A. Automatic transfer switches shall be by the generator manufacturer or by ASCO.

2.14 MECHANICALLY HELD TRANSFER SWITCH

A. The transfer switch shall be electrically operated and mechanically held with double throw construction, and operated by a momentarily energized solenoid-driven mechanism. Main operators shall include overcurrent disconnect devices; linear motors or gears shall not be acceptable.

B. All transfer switch sizes shall use only one type of main operator for ease of maintenance and commonality of parts.

C. The switch shall be positively locked and unaffected by momentary outages, so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum reliability and operating life.

D. All main contacts shall be silver composition. Switches rated 600 amperes and above shall have segmented, blow-on construction for high withstand and close-on capability and be protected by separate arcing contacts.

E. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. Switches rated 600 amps and higher shall have front removable and replaceable contacts. All stationary and moveable contacts shall be replaceable without removing power conductors and/or bus bars.

F. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof, which are not intended for continuous duty, repetitive switching or transfer between two active power sources, are not acceptable.

G. Where neutral conductors are to be solidly connected as shown on the plans, a neutral conductor plate with fully rated AL-CU pressure connectors shall be provided.

2.15 ENCLOSURE

A. The ATS shall be furnished in a NEMA 1 (A) enclosure.

B. All standard door mounted switches and long life super bright type indicating LEDs described in section 3 shall be integrated into a flush-mounted, interface membrane or equivalent in the enclosure door for easy viewing & replacement. The panel shall be capable of having manual locking feature to allow the user to lockout all membrane mounted control switches to prevent unauthorized tampering. This cover shall be mounted with hinges and have a latch that may be padlocked. The membrane panel shall be suitable for mounting by others when furnished on open type units.

2.16 CONTROLLER DISPLAY AND KEYPAD

A. A four line, 20 character LCD display and dynamic 4 button keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and limited control through the communications interface port. The following parameters shall only be adjustable via a password protected programming on the controller (dip switches shall not be acceptable):

1. Nominal line voltage and frequency
2. Single or three phase sensing
3. Operating parameter protection
4. Transfer operating mode configuration (Open transition, Closed transition, or Delayed transition)

All instructions and controller settings shall be easily accessible, readable and accomplished without the use of codes, calculations, or instruction manuals.

2.17 VOLTAGE, FREQUENCY AND PHASE ROTATION SENSING

A. Voltage (all phases) and frequency on both the normal and emergency sources shall be continuously monitored, with the following pickup, dropout, and trip setting capabilities (values shown as % of nominal unless otherwise specified):

Parameter Dropout/Trip Pickup/Reset Under voltage 75 to 98% 85 to 100% Over voltage 105 to 135% 95 to 100% of trip Under frequency 85 to 99% 95 to 99% Over frequency 105 to 120% 101 to 105% Voltage unbalance 5 to 20% 3% to 18%

B. Repetitive accuracy of all settings shall be within ± 0.5% over an operating temperature range of -20°C to 70°C.

C. An adjustable dropout time for transient voltage and frequency excursions shall be provided. The time delays shall be 0.1 to 9.9 seconds for voltage and 0.1 to 15 seconds for frequency.

D. Voltage and frequency settings shall be field adjustable in 1% increments either locally with the display and keypad or remotely via the communications interface port.

E. The controller shall be capable of sensing the phase rotation of both the normal and emergency sources. The source shall be considered unacceptable if the phase rotation is not the preferred rotation selected (ABC or BAC). Unacceptable phase rotation shall be indicated on the LCD; the service required LED and the annunciation through communication protocol and dry contacts. In addition, the phase rotation sensing shall be capable of being defeated, if required.

F. The controller shall be capable of detecting a single phasing condition of a source, even though a voltage may be regenerated by the load. This condition shall be considered a failed source.

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.) FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE: 03.14.2025
DRAWN BY: L. ORTIZ
CHECKED BY: J. CLARK
APPROVED BY: J. CLARK

PROJECT NO.: 23-005.D
CONTRACT NO.: -
SHEET NO.: E0.5

ELECTRICAL SPECIFICATIONS

PROFESSIONAL ENGINEER
JASON CLARK
0-56990-1B
U.S. VIRGIN ISLANDS

G. Source status screens shall be provided for both normal & emergency to provide digital readout of voltage on all 3 phases (phase to phase and phase to neutral), frequency, and phase rotation.

2.18 TIME DELAYS

A. An adjustable time delay of 0 to 10 seconds shall be provided to override momentary normal source outages and delay all transfer and engine starting signals. Capability shall be provided to extend this time delay to 60 minutes by providing an external 12 or 24 VDC power supply.

B. A time delay shall be provided on transfer to the emergency source, adjustable from 0 to 60 minutes, for controlled timing of transfer of loads to emergency.

C. A time delay shall be provided on re-transfer to normal. The time delays shall be adjustable from 0 to 60 minutes. Time delay shall be automatically bypassed if the emergency source fails and the normal source is acceptable.

D. A time delay shall be provided on shut down of engine generator for cool down, adjustable from 0 to 60 minutes.

E. A time delay activated output signal shall also be provided to drive external relay(s) for selective load disconnect control. The controller shall be capable of controlling a maximum of 9 individual output time delays to step loads on after a transfer occurs. Each output may be individually programmed for their own time delay of up to 60 minutes. Each sequence shall be independently programmed for transferring from normal to emergency and transferring from emergency to normal.

The controller shall also include the following built-in time delays for the following operations:

1. 0 to 60 minute time delay on failure to acquire the acceptable electrical parameters from the emergency source.
2. 0 to 60 minute time delay for a failure to synchronize on an in-phase operation.
3. 60 minute time delay for the load disconnect position for delayed transition operation.

F. All time delays shall be adjustable in 1 second increments.

G. All time delays shall be adjustable by using the display and keypad or with a remote device connected to the communications interface port through a security-password system.

H. All time delays shall be adjustable by using the display and keypad or with a remote device connected to the communications interface port through a security-password system.

I. Each time delay shall be identified and a dynamic countdown shall be shown on the display.

2.19 ADDITIONAL FEATURES

A. The controller shall have 3 levels of security. Level 1 shall allow monitoring of settings and parameters only. The Level 1 shall be capable of restricted with the use of a lockable cover. Level 2 shall allow test functions to be performed and Level 3 shall allow setting of all parameters.

B. Membrane-type switches shall be provided for the test functions and be maintained until the end test function is activated. The test function shall be allowed through password security. It shall be possible to defeat the password requirement by way of a circuit board mounted dip switch setting. The test function shall be load, no load or auto test. The auto test function shall request an elapsed time for test. At the completion of this time delay the test shall be automatically ended and a retransfer sequence shall commence. All loaded tests shall be immediately ended and retransfer shall occur if the emergency source fails and the normal source is acceptable.

C. A SPDT contact, rated 5 amps at 30 VDC, shall be provided for a low-voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output, and run for the duration of the cool down setting, regardless of whether the normal source restores before the load is transferred.

D. Auxiliary contacts, rated 10 amps, 250 VAC shall be provided consisting of two contacts, closed when the ATS is connected to the normal source and two contacts closed, when the ATS is connected to the emergency source.

E. LED indicating lights shall be provided; one to indicate when the ATS is connected to the normal source (green) and one to indicate when the ATS is connected to the emergency source (red).

F. LED indicating lights shall be provided and energized by controller outputs. The lights shall provide true source availability of the normal (green) and emergency sources (red), as determined by the voltage, frequency and phase rotation sensing trip and reset settings for each source.

G. A membrane switch shall be provided on the membrane panel to test all indicating lights and display when pressed.

H. Provide the ability to select "commit/no commit to transfer" to determine whether the load should be transferred to the emergency generator if the normal source restores before the generator is ready to accept the load.

I. Terminals shall be provided for a remote contact which opens to signal the ATS to transfer to emergency and for remote contacts which closes to inhibit transfer to emergency and/or retransfer to normal. Both of these inhibit signals can be activated through the keypad or the communications interface port. A "not-in-auto" LED shall indicate anytime the controller is inhibiting transfer from occurring.

J. An in-phase monitor shall be a standard feature in the controller. The monitor shall control transfer so that motor load inrush currents do not exceed normal starting currents, and shall not require external control of power sources. The in-phase monitor shall be specifically designed for and be the product of the ATS manufacturer. The in-phase monitor shall be capable of being enabled or disabled for the user interface.

K. Engine Exerciser – The controller shall provide an internal engine exerciser. The engine exerciser shall allow the user to program up to 21 different exercise routines based on a calendar mode. For each routine, the user shall be able to:

1. Enable or disable the routine.
2. Enable or disable transfer of the load during routine.
3. Set the start time:
   - time of day
   - day of week
   - week of month (1st, 2nd, 3rd, 4th, alternate or every)
4. Set the duration of the run.
5. At the end of the specified loaded exercise duration, the switch shall transfer the load back to normal and run the generator for the specified cool down period. All loaded exercises shall be immediately ended and retransfer shall occur if standby source fails. The next exercise period shall be displayed on the main screen with the type of exercise, time and date. The type of exercise and the time remaining shall be displayed when the exercise is active. It shall be possible of ending the exercise event with a single-button push.

L. Date and time – The date shall automatically adjust for leap year and the time shall have the capability of automatically adjusting for daylight saving and standard times.

M. System Status – The controller shall have a default display the following on:

1. System status
2. Date, time and type of the next exercise event
3. Average voltage of the preferred and standby sources

Scrolling through the displays shall indicate the following:

1. Line to line and line to neutral voltages for both sources
2. Frequency of each source
3. Load current for each phase
4. Single or three phase operation
5. Type of transition
6. Preferred source
7. Commit or no commit modes of operation
8. Source/source mode (Utility/Gen; Gen/Gen; Utility/Utility)
9. In phase monitor enable/disable
10. Phase rotation
11. Date and time

N. Controllers that require multiple screens to determine system status or display "coded" system status messages, which must be explained by references in the operator's manual, are not permissible.

O. Self-Diagnostics – The controller shall contain a diagnostic screen for the purpose of detecting system errors. This screen shall provide information on the status input signals to the controller which may be preventing load transfer commands from being completed.

P. Communications Interface – The controller shall be capable of interfacing, through a standard communications with a network of transfer switches and generators. It shall be able to be connected via an RS-485 serial communication (up to 4000 ft. direct connect or multi-drop configuration), an Ethernet connectivity (over standard 10baseT Ethernet networks utilizing a RJ-45 port or remotely utilizing a dial-up modem). This module shall allow for seamless integration of existing or new communication transfer devices and generators. Monitoring software shall allow for the viewing, control and setup of parameters of the genset and transfer switch network through a standard personal computer utilizing current Microsoft operating systems. Separate and specific transfer switch software interfaces shall not be acceptable.

Q. The transfer switch shall also be able to interface to 3rd party applications using Modbus RTU and Modbus TCP/IP open standard protocols utilizing Modbus register maps. Proprietary protocols shall not be acceptable.

R. The controller shall contain a USB port for downloading the controller's parameters and settings; exercise event schedules; maintenance records and event history. The file designator shall be the unique serial number of the transfer switch.

S. Data Logging – The controller shall have the ability to log data and to maintain the last 2000 events, even in the event of total power loss. The following events shall be time and date stamped and maintained in a non-volatile memory. The controller shall be able to display up to the last 99 events. The remaining events shall be downloadable to be displayed on a computer.

1. Event Logging
   Data, date and time indication of any event
2. Statistical Data
   Total number of transfers*
   Total number of fail to transfer*
   Total number of transfers due to preferred source failure*
   Total number of minutes of operation*
   Total number of minutes in the standby source*
   Total number of minutes not in the preferred source*
   Normal to emergency transfer time
   Emergency to normal transfer time
   System start date
   Last maintenance date
   * The statistical data shall be held in two registers. One register shall contain data, since startup and the second register shall contain data from the last maintenance reset.

T. External DC Power Supply – An optional provision shall be available to connect up to two external 12/24 VDC power supply to allow the LCD and the door mounted control indicators to remain functional when both power sources are dead for extended periods of time. This module shall contain reverse battery connection indication and circuit protection.

2.20 ACCESSORIES

A. Supervised Transfer Control Switch. The supervised transfer control switch shall provide a door mounted, three position, selector switch with Auto, Manual and Transfer positions.

The alarm module shall be required in order to activate this option.

1. With the controller set to the automatic mode and the selector switch in the auto position, the user transfer switch shall operate normally.
2. With the controller set to the automatic mode and the selector switch in the manual position, the user shall be required to toggle the selector switch to initiate a transfer from the emergency to the normal position.
3. With the controller set to the non-automatic mode and the selector switch in the manual position, the user shall be required to toggle the selector switch to the transfer position to initiate a transfer either direction. In this mode, the ATS shall not automatically transfer to an acceptable source in the case of source failure, without the user toggling the selector switch to the transfer position.

2.21 TESTS AND CERTIFICATION

A. Upon request, the manufacturer shall provide a notarized letter certifying compliance with all of the requirements of this specification including compliance with the above codes and standards. The certification shall identify, by serial number(s), the equipment involved. No exceptions to the specifications, other than those stipulated at the time of the submittal, shall be included in the certification.

B. The ATS manufacturer shall be certified to ISO 9001 International Quality Standards and the manufacturer shall have third party certification verifying quality assurance in design/development, production, and installation and servicing in accordance with ISO 9001.

2.22 SERVICE REPRESENTATIVE

A. The manufacturer shall maintain a national service organization of employing personnel located throughout the contiguous United States. The service center's personnel must be factory trained and must be on call 24 hours a day, 365 days a year.

B. The manufacturer shall maintain records of each switch, by serial number, for a minimum of 20 years.

3.0 EXECUTION

3.1 INSTALLATION

A. Mount generator on a re-enforced concrete pad. Concrete shall be 1 foot larger in all directions than footprint of generator. Mounting pad composition should follow standard practice for the required loading. Provide 3000 psi concrete reinforced with eight-gauge wire mesh or No. 6 reinforcing bars on 305 mm (12 in.) centers. The top surface of the mounting pad on which the generator set mounts should be within a flatness of 3 mm (1/8 in.). The weight of the single mounting pad or combined weight of multiple mounting pads should exceed the combined weight of the generator set and attached accessories.

3.2 MANUFACTURING

A. The unit shall be shipped to the job by the manufacturer's authorized dealer having a parts and service facility within a 120 mile radius of the job. In addition, and in order not to penalize the Owner for unnecessary or prolonged periods of time for service or repairs to the emergency system, the bidding generator set supplier must have replacement parts in stock at all times. Certified proof of this requirement shall be available from the dealer and a personal inspection of the dealer's facilities may be made by the Architect or his appointed representative to substantiate claims made by the generator set supplier.

3.3 TESTING

A. Prior to acceptance of the installation, equipment shall be tested to show it is free of any defects and will start automatically and be subjected to full load test through the use of portable, dry-type load banks supplied for this purpose at the job by the generator set supplier. Generator set shall be tested under varying loads with guards and exhaust system in place at factory before leaving manufacturer facility. Tests shall include single-step load pickup, shutdown device testing, and rated power at 0.8 PF. Provide copy of certified test record prior to shipment.

B. The load bank shall be capable of definite and precise incremental loading and shall not be dependent on the generator control instrumentation to read amperage and voltage of each phase. Rather, the test instrumentation will serve as a check of the generator set meters.

C. Saltwater brine tanks or those load banks requiring water as a source for cooling are not acceptable for this purpose and are disallowed and shall not be utilized for this test.

D. Load bank testing shall be done in the presence of the Owner or his appointed representative only after the unit is permanently installed in accordance with the Contract Documents. Testing shall be for a period of eight (8) hours under full load.

3.4 START UP AND INSTRUCTIONS

A. After mounting generator on pad, provide necessary protection against debris and moisture. Implement manufacturer recommended storage practices/guidelines necessary for optimal storage.

B. On completion of the installation, start-up shall be performed by the engine manufacturers' trained dealer service representative.

C. Operating and maintenance instruction manual shall be furnished and procedures explained to operating personnel.

3.5 SYSTEM SERVICE CONTRACT

A. The supplier of the standby power system must furnish a copy of, and make available to the Owner, his standard service contract which, at the Owner's option, may be accepted or refused. This contract will accompany any documents, drawings, catalog cuts, specification sheets, wiring or outline drawings, etc. submitted for approval. This contract shall be for the complete power system.

3.6 GUARANTEE

A. Equipment provided under this Section shall be guaranteed against defective parts and workmanship under terms of the manufacturer's and dealer's standard warranty. But in no event shall it be for a period of less than five (5) years from date of initial startup of the system and shall include labor and travel time for necessary repairs at the job. Warranty period shall not begin until the tenant's move-in date.

– END OF SECTION –

SECTION 287210
LIFE SAFETY SYSTEMS

1.0 GENERAL

1.01 DESCRIPTION

A. This section of the specification includes the furnishing, installation, connection and testing of the microprocessor controlled, intelligent reporting fire alarm equipment required to form a complete, operative, and coordinated system.

B. The fire alarm system shall comply with requirements of the latest NFPA Standard 72 for Protected Premises Signaling Systems and all local codes and regulations. The system shall be electrically supervised and monitor the integrity of all conductors. The manufacturer shall confirm all codes have been met and all necessary devices provided prior to submitting price.

C. Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded onto the Signaling Line Circuits.

D. The system shall be an active/interrogative type system where each transponder is repetitively scanned, causing a signal to be transmitted to the local fire alarm control panel/node indicating that the transponder and its associated initiating device and notification appliance circuit wiring is functional. Loss of this signal at the local FACP shall result in a trouble indication on both the FACP display and at the network display, as specified hereinafter for the particular input.

E. The system shall be arranged such that not less than 20 percent additional transponders may be inserted into any network communication loop.

F. Manufacturer of all fire alarm system devices shall match the existing base building system.

G. The installing company shall employ NICET (minimum Level II Fire Alarm Technology) technicians on site. To guide the final checkout and to ensure the systems integrity, the submitting company shall employ NICET Level IV minimum managers and engineers. Proof of NICET level training shall be included as part of submittal package and kept on site with personnel.

H. The installing company shall be UL listed for fire alarm installations. UL certificate shall accompany submittal package. The certification listing category shall be UUJJ and shall be indicated in the project submittal.

I. The Contractor shall make arrangements and pay all fees in connection with the testing of the Life Safety System. All system devices shall be tested for their correct operation, except non-restorable type heat detectors which shall be sample tested. All tests carried out shall meet the requirements of the local authority having jurisdiction.

J. The system shall have proper listing and/or approval from the following nationally recognized agencies:

1. Factory Mutual Systems
2. Underwriters Laboratories

1.02 SCOPE

A. The fire detection system installed in the existing building shall be expanded in accordance to the project specifications and drawings.

B. Basic Performance

1. Each SLC loop shall be wired NFPA 72 Style 4 (Class B).
2. Initiation Device Circuits (IDC) shall be wired (NFPA Style B) as part of an addressable device connected by the SLC circuit.
3. Notification Appliance Circuits (NAC) shall be wired (NFPA Style Y) as part of an addressable device connected by the SLC circuit or a panel circuit.
4. NAC speaker circuits shall be arranged such that there is a minimum of one speaker circuit per floor of the building or smoke zone, which ever is greater.
5. NAC speaker circuits and control equipment shall be arranged such that loss of any one (1) speaker circuit will not cause the loss of any other speaker circuit in the system.

C. Basic System Functional Operation

1. As part of the fire alarm; when a fire alarm condition is detected and reported by one of the system initiating devices (except the smoke detectors located in air supply path of the stairwell and/or elevator shaft pressurization fans), the following functions shall immediately occur:
   a. FACP will sound and display the alarm condition showing the device address, location, zone information, time/date, and device type.
   b. The remote annunciator will sound and display the same information as shown on the FACP display unit.
   c. Via system programming, the horn/bell outputs for all zones will activate and sound in temporal 3-3 pattern in synchronized fashion until silenced from FACP panell.
   d. All strobes with activated horn/bell outputs shall flash in a synchronized pattern until silenced from the FACP panel.
   e. Automatic functions including, but not limited to: supply/return fan shutdown shall be activated via system programming as directed by codes and/or drawings.
   f. Provide signals to the mechanical controls including smoke dampers to shut down or reroute air-handling systems to prevent the recirculation of smoke.
   g. Initiate a preprogrammed timing sequence.
   h. Actuation of any smoke detector located in the air handling units and/or equipment rooms shall activate signals to the mechanical controls.
   i. It shall be possible to silence the alarm signals by operating the signal silence switch. However, the activation of another zone shall repeat the entire alarm process, thus causing the signals to resound.
   j. Silencing the alarm shall cause all speakers to silence. Firelights will continue to flash.
2. General Operation
   a. Power failures, opens, grounds or any disarrangement of the system wiring or components shall be indicated by a visual and audible trouble signal. The audible trouble signal may be silenced, however, the trouble LED shall remain lit until the system has been returned to normal operating condition.

1.03 SUBMITTALS

A. General

1. Copies of all submittals shall be submitted to the Architect/Engineer for review prior to acceptance of system.
2. All references to manufacturer's model numbers and other pertinent information herein is intended to establish minimum standards of performance, function and quality.
3. The authority having jurisdiction shall be notified prior to installation of equipment wiring. Complete information regarding the system include specifications, wiring diagrams, battery and power supply calculations, floor plans and graphics shall be submitted for approval.
4. If submittals, upon review by the Owner and/or Owner's representative, are found not to conform with the performance, type and quality of products as well as other requirements of these specifications; the Contractor shall be required to submit. The Contractor shall be responsible for the Owner's extra expenses for subsequent review(s) of rejected submittals. Such extra feeds shall be deducted from payments by the Owner to the Contractor. Approval of the submittals by the Owner shall, in no case, relieve the Contractor of the responsibility to meet the requirements of this specification.

B. Shop Drawings

1. Drawings shall include the following minimum requirements for submittal:
   a. Point-to-point wiring/conduit layout for all devices on 1/8" scale.
   b. Device placement showing all addresses and device ID.
   c. All panel and equipment terminations.
   d. All circuit voltage drop and current calculations spread sheets.
   e. All battery calculation spreadsheets.
   f. Legend reflecting device description, manufacturer, model number, and backbox requirement.
   g. Wiring legend reflecting wire function, type, and recommended manufacturer's part number.
   h. Full sequence of operations.
   i. Power supply and amplifier calculations.
2. Specification data sheets on each individual system component.

C. Data Sheets

1. Submit simultaneously with the shop drawings, complete manufacturer's technical data sheets showing product description, listings, and specs.
2. Copies of NICET II and IV certifications.
3. Copy of company UL listing certificate.

1.04 APPLICABLE STANDARDS AND SPECIFICATIONS

A. The specifications and standards listed below form a part of this specification. The system shall comply with the latest standards.

1. National Fire Protection Association (NFPA), 2019 Edition – USA:
   No. 13 Sprinkler Systems
   No. 13A Halon 1301 Extinguishing Systems
   No. 17 Dry Chemical Extinguishing Systems
   No. 17A Wet Chemical Extinguishing Systems
   Clean Agent Extinguishing Systems
   No. 70 National Electrical Code
   Specifically Article 760
   No. 72 2019 National Fire Alarm Code
   No. 101 2018 Life Safety Code
2. Standard Building Code, 2018 Edition
3. American National Standard A17.1–1980
4. Underwriter's Laboratories Fire Resistance Directory
5. Local and State Building Codes
6. ADA Public Law 101–336
7. All requirements of the Authority Having Jurisdiction (AHJ)

1.05 APPROVALS

A. The system shall have proper listing, approval and labeling from the following nationally recognized agencies:

FM Factory Mutual Systems
UL Underwriters Laboratories

1.06 SYSTEM FEATURES

A. The system shall include the following features as a minimum:

1. During an alarm condition, the LCD annunciator shall display the activated alarm until acknowledged. This shall allow determination of where the last alarm has taken place.
2. Ground fault detection in wiring on either plus or minus side.
3. Separate alarm and trouble shall be displayed on the LCD annunciator.
4. Resound feature.
5. "Dead Front" design control panel with all LED alarm trouble and power on indicators and all switches located behind a locked tempered glass door.
6. Solid state construction.
7. All alarm initiating circuit wiring, signal circuit wiring, speaker circuit wiring and emergency phone circuit wiring shall be supervised.
8. Automatic transfer to standby batteries upon power failure.
9. Lightning and surge protection.

2.0 PRODUCTS

2.01 CONDUIT AND WIRE

A. All fire alarm wiring shall be installed in conduit. Conduit shall be installed as required by specification section 261000.

B. Wiring shall be in accordance with local, state and National codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system.

C. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.

D. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes from the generator powered source.

E. All junction boxes and conduit utilized for fire alarm system cabling shall be painted red.

F. All circuit breakers serving the fire alarm system shall include red marking and a listed locking mechanism per NFPA 72.

2.02 MAIN FIRE ALARM CONTROL PANEL

A. The FACP shall be completely microprocessor based.

B. System Capacity and General Operation:
1. Configure size of panel to operate number of SLC circuits in a fashion so that each circuit handles no greater than 70% load of capacity or a maximum of 5 floors per circuit.
2. The fire alarm control panel shall include a full-featured operator interface and backlit 80-character Liquid Crystal Display (LCD).
3. The FACP shall provide the minimum following features:
   a. Drift compensation to extend detector accuracy over life.
   b. Detector sensitivity test, per NFPA 72, Chpt 7.
   c. Maintenance alert, to warn of excessive smoke detector dirt or dust accumulation.
   d. Multiple sensitivity levels for alarm, selected by detector.
   e. System status reports to display and printer. Provide printer.
   f. Alarm verification, with verification counters.
   g. Cross zoning with the capability of counting two detectors in alarm.
   h. Walk test.
   i. UL-1076 security monitor points.
   j. Control-by-time with holiday schedules.
   k. Day/night automatic adjustment of detector sensitivity.
   l. Device blink control for sleeping areas.
   m. Releasing capability.
   n. Pre-Alarm.
   o. Selectable sensitivity levels, three minimum.
   p. History Storage, with a minimum of 400 events.
   q. Point Enable/Disable.
   r. Point Read (status and level of obscuration).
   s. Output point for connection to any building EMS.

C. Signaling Line Circuits (SLC)
1. Each SLC interface shall provide power to communicate with 99 intelligent detectors (ionization, photoelectric or thermal) and 99 intelligent modules (monitor or control).
2. Each SLC circuit shall not exceed 70% load capacity or cover more than 5 floors.

D. Serial Interface
1. The system shall include two serial EIA-232 interfaces. Each interface shall be a means of connecting UL Listed Electronic Data Processing (EDP) peripherals.
   a. One serial port shall support a serial printer.
   b. One serial port shall support a CRT/NRT device.
   c. The system shall include-an EIA-485 port for the serial connection of annunciators and remote LCD displays.

E. Voice Telephone Command Center (VTCC)
1. The Voice Telephone Command Center (VTCC) shall contain equipment required for all audio control, telephone system control, signaling and supervisory functions. This shall include:
   a. Tone generators.
   b. Digital voice units.
   c. Microphone for manual paging/all call.
   d. Main telephone handset.
   e. Speaker/phone circuit annunciation and control modules for manual activation of each individual speaker circuit and each individual microphone/annunciator circuit.

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION

CONSULTANTS

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BW&A Job No. 2024-1102

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE: 03.14.2025
DRAWN BY: L. ORTIZ
CHECKED BY: J. CLARK
APPROVED BY: J. CLARK

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: E0.6

ELECTRICAL SPECIFICATIONS

PROFESSIONAL ENGINEER
JASON CLARK
0-36990-181
U.S. VIRGIN ISLANDS

f. Integral Digital Message Generator with a capacity of up to 60 seconds. The Digital Message Generator shall be capable of primary and secondary messages (30 seconds each). These messages shall be field programmable without the use of additional equipment.

g. Built in alert tone generators with steady, slow whoop, high/low and chime tone field programmable.

h. Provide list of evacuation pre-recorded messages and pre-alert tones to owner before ordering for selection.

i. The Voice Control Panel shall have the ability to transmit up to 4 simultaneous evacuation message channels.

2. The one-way voice communications system shall be comprised of a local microphone, single channel audio controller/tone generator/digital message player and, if shown on the plans up to eight (8) remote microphone/annunciator panels.

3. Provide individual selector switches and indicator lights for each speaker circuit at the fire command center and at each remote microphone/annunciator.

4. Provide amplifiers. Size the amplifiers to accommodate each speaker being set at a one-watt tap with twenty watts reserve per floor.

F. Field Charging Power Supply (FCPS): The FCPS is a device designed for use as either a remote 24-volt power supply or used to power Notification Appliances.

1. The FCPS shall offer up to 6.0 amps (4.0 amps continuous) of regulated 24-volt power. It shall include an integral charger designed to charge 7.0 amp hour batteries. Provide batteries to support 60-hour standby with ten minutes of alarm indication at the end of this period. Battery charger shall be capable of recharging all batteries to seventy percent capacity in twelve hours.

2. The Field Charging Power Supply shall have four outputs (two Style Y/Z and two style Y) shall be available for connection to the Notification devices.

3. Provide 20-watt spare capacity in each electrical room on each floor for tenant audible circuits. Locate in a junction box clearly labeled "tenant fire alarm audible circuits".

4. Provide 1ea. Field Charging Power Supply (DC) per floor to allow for tenant build-out expansion of MAC devices. At no time shall there exceed 70% load capacity of any FCPS on any of the common levels. Provide power capacity as follows:

Floor Size	Capacity
<25,000 gross sq. ft.	6 amps DC
25,001 to 35,000 gross sq. ft.	10 amps DC
35,001 gross sq. ft. and greater	consult engineer

5. Locate audible (where required) and visual power supplies adjacent to one another and in a location within each room approved by the engineer.

6. Provide battery capacity and amplifier capacity in the main fire control panel for addition of tenant devices described above.

G. Audio Amplifiers

1. The audio amplifiers will provide audio power for distribution to the speaker circuits.

2. The amplifier shall include audio input and amplified output supervision; back up input, and automatic switchover to back up (if primary amplifier should fail).

3. Amplifiers shall be available in 30, 100, and 120-watt versions.

4. Provide amplifiers sized to accommodate each speaker being set at a one-watt tap with twenty watts reserve per floor.

5. Hardwired indicating appliance circuits (fire lights and speakers) shall be Style Y per NFPA 72. Provide one light circuit per floor and provide one speaker circuit per floor, one speaker circuit per stairwell and, one speaker circuit per elevator cab.

6. Provide at least two on board relays to operate door holders etc.

7. Provide necessary modules to operate remote supervised relays for fan control, elevator control, etc.

2.03 SYSTEM COMPONENTS

A. Horns/Bells

1. All Horns/Bells shall be installed as shown on drawings and in accordance with NFPA 72 and local codes.

2. Horns shall produce a nominal sound output of 84 dBA at 10 feet (3m) or 15 dBA above ambient noise levels with a minimum sound output of 15 dBA.

3. Horns shall be UL-464 listed for fire evacuation and operate on 12 or 24 voltage in a temporal 3-3 pattern.

4. The back of each speaker shall be sealed to protect the speaker cone from damage and dust.

3. Speaker color shall match base building. Provide building standard.

4. Provide a unit cost to add two (2) speakers. This unit cost shall be applied to additional speakers that may be required at the request of the Fire Marshal during field inspections.

B. Strobe Lights

1. All Strobe Lights shall meet the requirements of the ADA, UL Standard 1971.

2. Strobe intensity and flash rate shall meet the requirements of UL 1971, ADA and NFPA 72.

3. Combination horn/strobe devices shall meet all above requirements as well as horn/bell requirements listed herein.

4. Strobe unit shall mount to a four inch square electrical outlet box. The strobe light shall have a white lens with red "FIRE" imprinted on it. When the unit is a combination speaker/strobe, the speaker portion shall comply wit the requirements stated in A. above.

5. All strobes shall have selectable output intensities from 15 to 110 cd. The intensity selected shall meet NFPA 72 requirements for the layout shown on the drawings.

6. Strobes and strobe spacing shall be provided to comply with NFPA 72.

7. Provide a unit cost to add two (2) strobes including required signal circuits. This unit cost shall be applied to additional strobes that may be required at the request of the Fire Marshal during field inspections.

C. Smoke Dampers

1. Smoke dampers shall be provided by Division 23.

2. Provide a smoke detector at each smoke damper location to meet the requirements of NFPA 72. Confirm quantities and locations of smoke detectors required for smoke dampers with Division 23. Provide 120 volt power as required for operation of smoke dampers.

2.04 SYSTEM COMPONENTS – ADDRESSABLE DEVICES

A. Addressable Devices – General

1. Detectors shall be intelligent (analog) and addressable, and shall connect with two wires to the fire alarm control panel signaling line circuits.

2. Addressable photoelectric smoke and thermal detectors shall provide alarm and power/polling LEDs. LED(s) shall flash under normal conditions and LED(s) shall be placed into steady illumination by the control panel, indicating an alarm condition.

3. The fire alarm control panel shall permit detector sensitivity adjustment through field programming of the system.

4. Detectors will operate in an analog fashion, where the detector simply measures its designed environment variable and transmits an analog value to the FACP based on real-time measured values. The FACP software, not the detector, shall make the alarm/normal decision, thereby allowing the sensitivity of each detector to be set in the FACP program and allowing the system operator to view the current analog value of each detector.

5. All field wiring is to be terminated on the detector base, not on the sensor head. Addressing of detectors shall be via integral decade switches built into sensor. Devices requiring separate addressing means will not be accepted.

6. Any additional equipment required to program devices are not acceptable.

B. Intelligent Photoelectric Smoke Detector

1. The detectors shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density.

2. Provide photoelectric smoke detector heads with bases as required. Detectors shall be of the solid state photoelectric type utilizing a stable LED light source and a silicone photo diode as the receiving element to form a highly accurate means of smoke detection. Internal detector circuits shall be shielded against electrical interference and resistant to transients, noise and, RF interference. Detector shall be low profile, the complete unit including base shall not exceed 1.875 inches in depth. Detector shall have a dual purpose red LED that flashes continuously to show that the device is operating and, that comes on steady to show that the device is in alarm.

3. Nominal detector sensitivity shall be 1.4% per foot obscuration with a range of 1% to. 1.84%. Regardless of sensitivity settings, the detector's stability shall be unaffected by high air velocity. No radioactive materials shall be used.

4. Provide smoke detectors in elevator lobbies, at stairwell doors, in telephone rooms, electrical rooms, mechanical rooms, elevator pits, the top of the elevator shaft, adjacent to the fire alarm control panel, fire pump room, computer rooms as defined by NFPA 90, chiller plants, pump rooms, UPS rooms and elevator machine rooms.

C. Duct Smoke Detectors

1. Duct smoke detectors shall be addressable type with visual alarm and power indicators. Provide remote LED/test stations where duct detectors are mounted in non-visible areas.

2. Each detector shall be installed upon the composite supply/return air duct(s), with properly sized air sampling tubes where required. Confirm quantities of smoke dampers required for mechanical equipment with Division 23.

3. Each duct detector shall be installed along with addressable control module as needed for fan shutdown and/pr smoke control. Detectors zoned with other devices shall be capable of operating its control module even if all other devices on their circuit have gone into alarm.

4. Duct detectors shall be provided by this division, installed by mechanical contractor and electrical connected to the fire alarm system by the electrical contractor.

D. Addressable Dry Contact Monitor Module

1. Addressable monitor modules shall be provided to connect one supervised IDC zone of conventional alarm initiating devices (any N.O. dry contact device such as flow, tamper, release systems, etc.) to one of the fire alarm control panel SLCs.

1. The IDC zone shall be suitable for Style D or Style B operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel.

2. For difficult to reach areas, the monitor module shall be available in a miniature package and shall be no larger than 2-3/4 inch (70 mm) x 1-1/4 inch (31.7 mm) x 1/2 inch (12.7 mm). This version need not include Style D or an LED.

3. Monitor module shall be provided for all sprinkler flow and tamper switches. Switches are furnished and installed by others and electrically connected to the fire alarm system by the electrical contractor. Verify quantities and coordinate installation of devices required with fire protection shop drawings. Provide connections to devices per fire protection shop drawings.

E. Addressable Control Module

1. Addressable control modules shall be provided to supervise and control the operation of one conventional NACs of compatible, 24 VDC powered, polarized audio/visual notification appliances. For fan shutdown and other auxiliary control functions, the control module may be set to operate as a dry contract relay. Each relay shall have a red LED mounted on its cover to indicate if that relay has been activated.

2. The control module NAC may be wired for Style Z or Style Y (Class A/B) with up to 1 amp of inductive A/V signal, or 2 amps of resistive A/V signal operation, or as a dry contact (Form-C) relay. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relay or NACs may be energized at the same time on the same pair of wires.

3.0 EXECUTION

3.01 INSTALLATION

E. Provide all equipment, wiring, conduit and outlet boxes required for the erection of a complete and operating system in accordance with applicable local, state and national codes, the manufacturer's recommendations, these plans and specifications. Color code shall be used throughout.

3.02 TEST

A. The manufacturer's authorized representative shall provide supervision of final system panel connections, perform a complete functional test of the system and submit a written report to the contractor attesting to the proper operation of the system. This shall include audibility and intelligibility testing per NFPA 72 2019, after furniture has been installed.

3.03 FINAL INSPECTION

A. Upon completion of the installation, the electrical contractor shall provide to the architect, with a copy to the manufacturer's representative, a signed written statement attesting that all system equipment was installed in accordance with these specifications and in accordance with wiring diagrams, instructions and directions provided to the contractor by the manufacturer.

3.04 INSTRUCTION

A. Instruction shall be provided as required for operating the system. Hands-on demonstrations of the operation of all system components shall be provided and shall include one session for a period of 8 hours. Additional time that may be required for end-user training will be at added cost to owner.

3.05 GUARANTEE

A. All equipment and wiring shall be guaranteed against defects in materials and workmanship for a two year period from the start up and beneficial use of the system. Warranty service for the equipment shall be provided by the manufacturer's factory trained representative during normal working hours, Monday through Friday excluding holidays. Emergency service provided at times other than as stipulated above shall be available from the same source at additional cost to the owner.

3.06 INSPECTIONS

A. Upon satisfactory completion of the system test, the manufacturer's representative shall present for the owner's consideration, a proposal to provide semi-annual inspection and tests of the system.

– END OF SECTION –

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION

CONSULTANTS

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BW&A Job No. 2024-1102

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

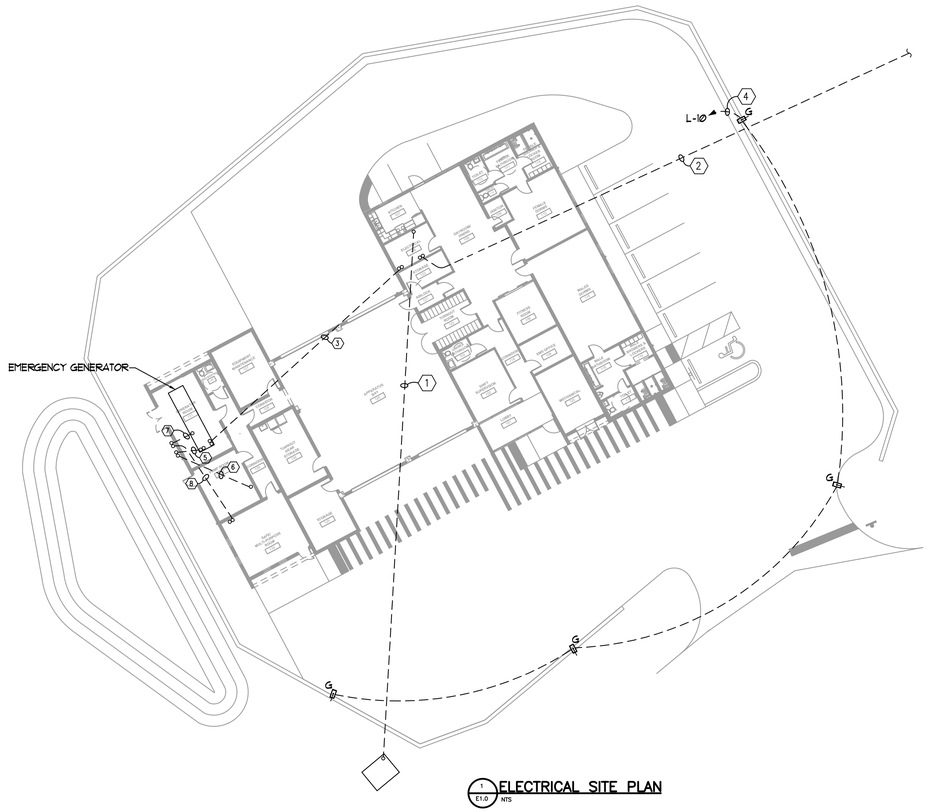
DATE: 03.14.2025
DRAWN BY: L. ORTIZ
CHECKED BY: J. CLARK
APPROVED BY: J. CLARK

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: E0.7

ELECTRICAL SPECIFICATIONS

PROFESSIONAL ENGINEER
JASON CLARK
0-56990-111
U.S. VIRGIN ISLANDS



1 E1.0 ELECTRICAL SITE PLAN
NTS

GENERAL NOTES:
(APPLY TO THIS SHEET ONLY)

1. DRAWINGS ARE FOR DESIGN INTENT ONLY. COORDINATE EXACT TERMINATION POINTS AND LOCATIONS OF ALL CONDUITS IN THE FIELD COORDINATE EXACT CONDUIT ROUTING AND STUB-UP LOCATIONS WITH ARCHITECT AND CIVIL ENGINEER.
2. PROVIDE ALL EMPTY CONDUITS WITH PULLSTRINGS.
3. PROVIDE CONDUITS NECESSARY FOR SYSTEM GROUNDING AS REQUIRED. REFER TO GROUNDING DETAILS AND ELECTRICAL RISER DIAGRAM FOR ADDITIONAL DETAILS.
4. COORDINATE CONDUIT ROUTING WITH CISTERN. ROUTE CONDUITS THROUGH SLAB AS REQUIRED.

LEGEND NOTES:
(APPLY TO THIS SHEET ONLY)

1. PROVIDE CONDUITS BETWEEN UTILITY TRANSFORMER AND MAIN DISTRIBUTION PANEL. REFER TO ELECTRICAL RISER DIAGRAM FOR ADDITIONAL DETAILS. COORDINATE ROUTING WITH CIVIL ENGINEER.
2. PROVIDE (2) 2" CONDUITS BETWEEN ELECTRICAL ROOM 108 AND NEAREST TELEPHONE POLE FOR LOW VOLTAGE SERVICE INTO BUILDING. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH OWNER, ARCHITECT, AND CIVIL ENGINEER.
3. PROVIDE CONDUIT BETWEEN EMERGENCY GENERATOR AND AUTOMATIC TRANSFER SWITCH "ATS-S". REFER TO ELECTRICAL RISER DIAGRAM FOR FURTHER DETAILS.
4. ROUTE CIRCUIT THROUGH LIGHTING CONTROL PANEL. CIRCUIT SHALL TURN OFF WHEN THERE IS SUFFICIENT DAYLIGHT AVAILABLE.
5. PROVIDE CONDUIT BETWEEN GENERATOR AND TEMPORARY GENERATOR DOCKING STATION "GDS-FIRE PUMP". REFER TO ELECTRICAL RISER DIAGRAM FOR FURTHER DETAILS.
6. PROVIDE CONDUIT BETWEEN TEMPORARY GENERATOR DOCKING STATION "GDS-FIRE PUMP" AND FIRE PUMP CONTROLLER. REFER TO ELECTRICAL RISER DIAGRAM FOR FURTHER DETAILS.
7. PROVIDE CONDUIT BETWEEN GENERATOR AND TEMPORARY GENERATOR DOCKING STATION "GDS-SAFE ROOM". REFER TO ELECTRICAL RISER DIAGRAM FOR FURTHER DETAILS.
8. PROVIDE CONDUIT BETWEEN TEMPORARY GENERATOR DOCKING STATION "GDS-SAFE ROOM" AND AUTOMATIC TRANSFER SWITCH "ATS-LR". REFER TO ELECTRICAL RISER DIAGRAM FOR FURTHER DETAILS.

REVISIONS

NO.	DATE	REMARKS
	03/14/2025	ISSUED FOR CONSTRUCTION

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

NO.3C-C-1 ESTATE FORTUNA,
WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

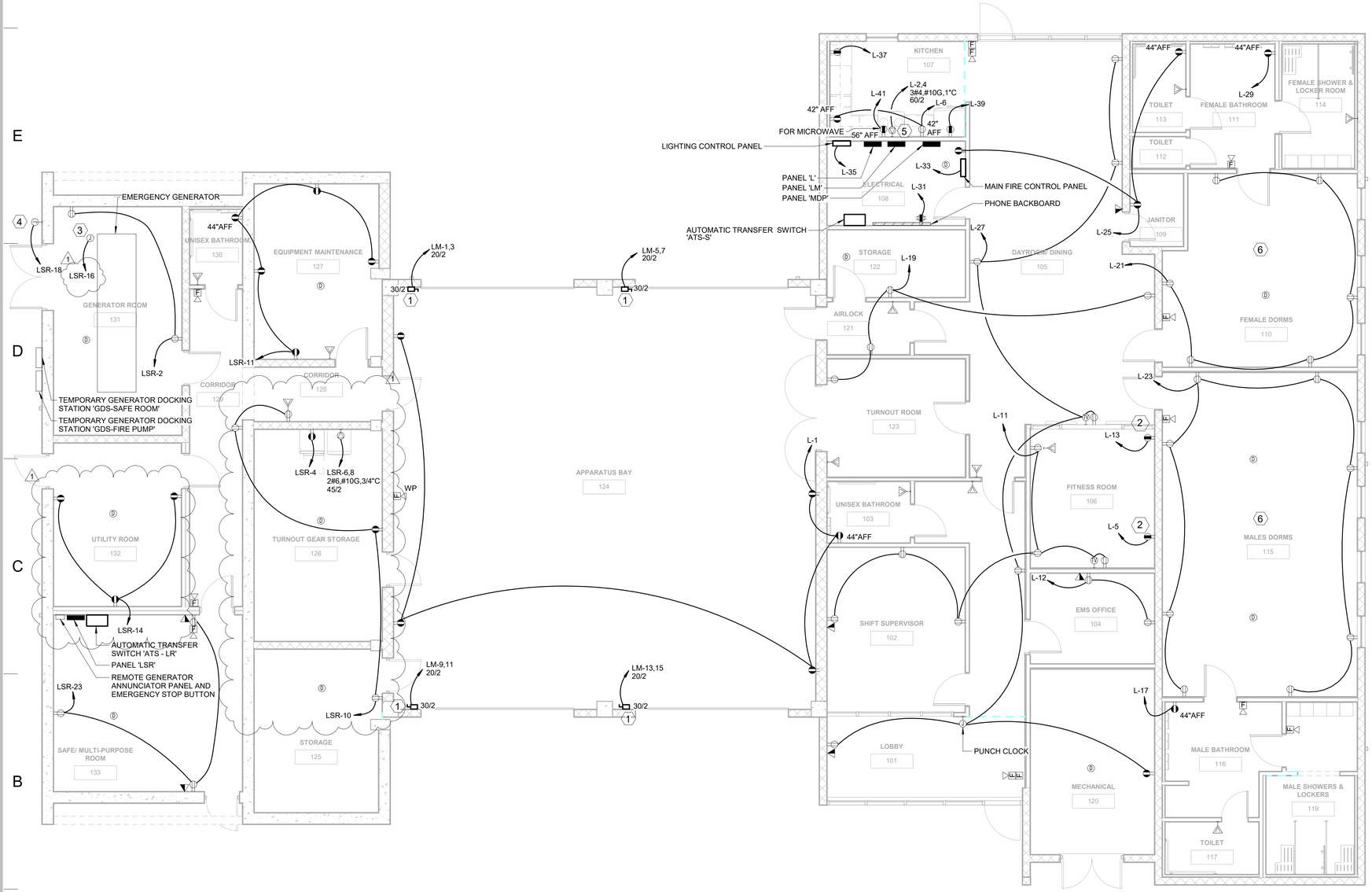
DATE: 03.14.2025
DRAWN BY: L. ORTIZ
CHECKED BY: J. CLARK
APPROVED BY: J. CLARK

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: E1.0

ELECTRICAL SITE PLAN

PROFESSIONAL ENGINEER
JASON CLARK
0-56990-111
U.S. VIRGIN ISLANDS



1 E2.0 ELECTRICAL FLOOR PLAN
3/16" = 1'-0"

GENERAL NOTES:
(APPLY TO THIS SHEET ONLY)

1. REFER TO DRAWING E0.0 FOR SYMBOLS LEGEND.
2. DRAWING IS FOR DESIGN INTENT ONLY. CONTRACTOR SHALL DETERMINE EXACT CONDUIT ROUTING IN THE FIELD WITH ALL OTHER TRADES.
3. COORDINATE EXACT LOCATION AND MOUNTING HEIGHTS OF ALL DEVICES WITH ARCHITECT. DEVICE AND COVERPLATE FINISHES TO BE SELECTED BY ARCHITECT.
4. COORDINATE EXACT LOCATION AND REQUIREMENTS OF LOW VOLTAGE AND SECURITY SYSTEMS WITH RESPECTIVE CONSULTANT AND ARCHITECT. PROVIDE ALL CONDUITS, JUNCTION BOXES, PULL BOXES, ETC. INDICATED ON CONSULTANT'S PLANS.
5. COORDINATE ALL THROUGH FLOOR STUB-UP LOCATIONS WITH STRUCTURE AND ARCHITECT. FLOOR PENETRATIONS SHALL BE FIRE SEALED AS REQUIRED.
6. VERIFY ELECTRICAL REQUIREMENTS AND RECEPTACLE NEMA TYPES FOR EQUIPMENT WITH EQUIPMENT SUPPLIER/SUBMITTAL PRIOR TO INSTALLATION.
7. COORDINATE EXACT ELECTRICAL REQUIREMENTS AND LOCATIONS FOR ALL PLUMBING AND MECHANICAL EQUIPMENT WITH DIVISION 22 AND 23, RESPECTIVELY. PROVIDE FUSED DISCONNECTS AS REQUIRED BY MANUFACTURER'S RECOMMENDATIONS. PROVIDE NEUTRAL CONDUCTORS IF REQUIRED BY MANUFACTURER.
8. PROVIDE PULLSTRING IN ALL EMPTY CONDUITS.
9. MAINTAIN FIRE RESISTANCE RATING OF WALLS WITH PENETRATIONS AND RECESSED OUTLET BOXES. MAINTAIN SPACING PER IBC AND MANUFACTURER. PROVIDE UL FIRE STOPPING AS REQUIRED.

LEGEND NOTES:
(APPLY THIS SHEET ONLY)

1. PROVIDE DISCONNECT FOR CONNECTION TO MOTORIZED OVERHEAD DOOR. COORDINATE EXACT REQUIREMENTS WITH ARCHITECT/VENDOR PRIOR TO INSTALLATION.
2. PROVIDE DEDICATED RECEPTACLE FOR CONNECTION TO TREADMILL. COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATIONS.
3. PROVIDE JUNCTION BOX FOR POWER CONNECTIONS TO GENERATOR BATTERY CHARGER. COORDINATE WITH GENERATOR MANUFACTURER FOR FURTHER DETAILS.
4. PROVIDE JUNCTION BOX FOR CONNECTION TO REMOTE FUEL STATION FILL STATION. COORDINATE WITH DIVISION 22/23.
5. COORDINATE EXACT REQUIREMENTS FOR RANGE WITH OWNER PRIOR TO INSTALLATION.
6. ALL RECEPTACLES IN THIS ROOM SHALL BE TAMPER-RESISTANT.

REVISIONS

NO.	DATE	REMARKS
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CONSULTANTS

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ESTATE FORTUNA (TANGO CO.) FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

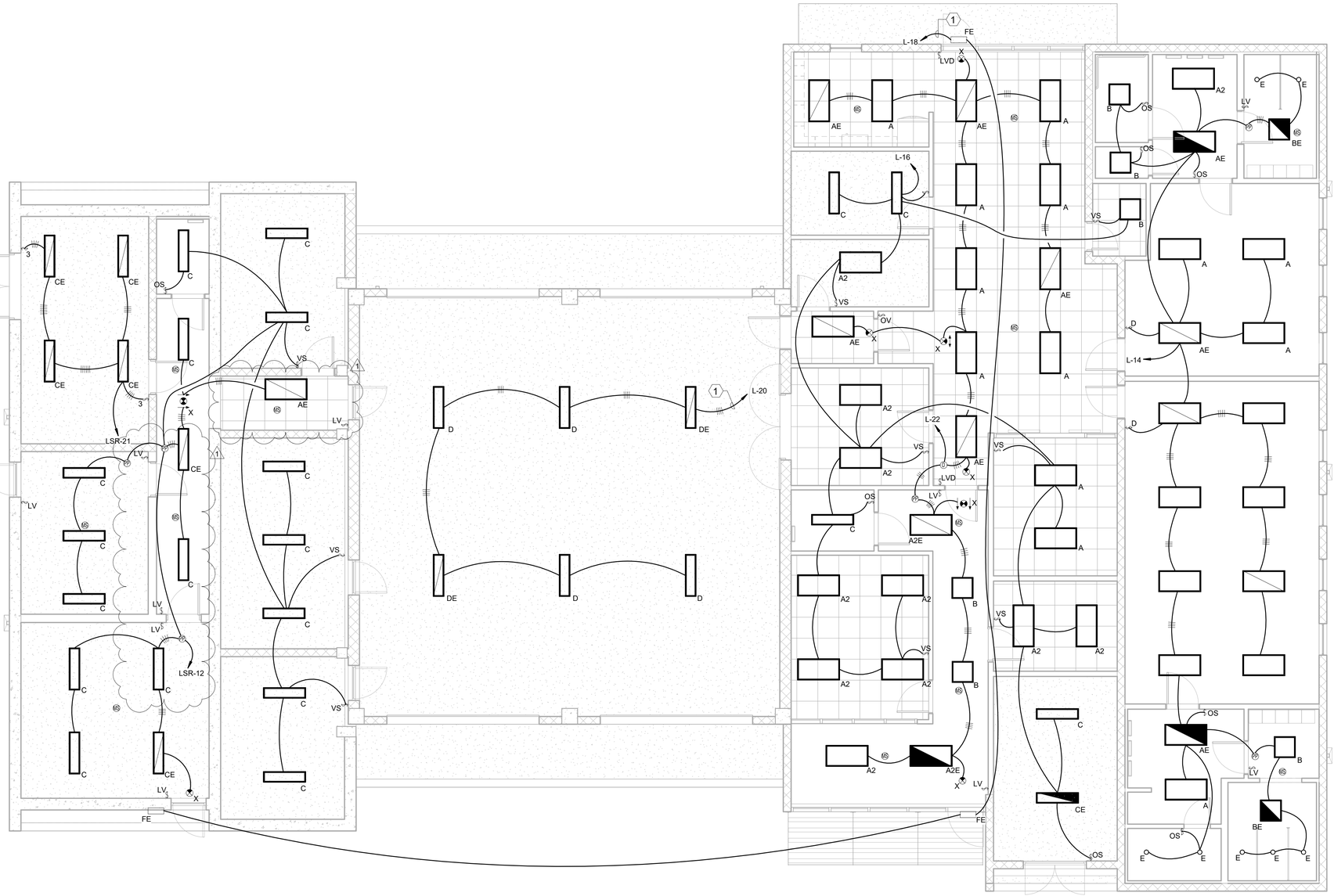
DATE: 03.14.2025
DRAWN BY: L. ORTIZ
CHECKED BY: J. CLARK
APPROVED BY: J. CLARK

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: E2.0

ELECTRICAL FLOOR PLAN

PROFESSIONAL ENGINEER
JASON CLARK
0-56590-1B
U.S. VIRGIN ISLANDS



1 E3.0 LIGHTING FLOOR PLAN
3/16" = 1'-0"

GENERAL NOTES:
(APPLY TO THIS SHEET ONLY)

1. REFER TO DRAWING E0.0 FOR SYMBOLS LEGEND AND LIGHTING FIXTURE SCHEDULE.
2. DRAWING IS FOR DESIGN INTENT ONLY. CONTRACTOR SHALL DETERMINE EXACT CONDUIT ROUTING IN THE FIELD.
3. MAINTAIN FIRE RESISTANCE RATING OF WALLS WITH PENETRATIONS AND RECESSED OUTLET BOXES. MAINTAIN SPACING PER IBC AND MANUFACTURER. PROVIDE UL FIRE STOPPING AS REQUIRED.
4. COORDINATE COLOR/FINISH OF FIXTURES AND COVERPLATES WITH ARCHITECT.

LEGEND NOTES:
(APPLY TO THIS SHEET ONLY)

1 ROUTE CIRCUIT THROUGH LIGHTING CONTROL PANEL FOR TIME SCHEDULE AND PHOTOCELL CONTROL.

REVISIONS

NO.	DATE	REMARKS
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1	09/05/2025	REV 1

CONSULTANTS

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ESTATE FORTUNA (TANGO CO.) FIRE STATION

NO.3C-C-1 ESTATE FORTUNA, WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE:	03.14.2025
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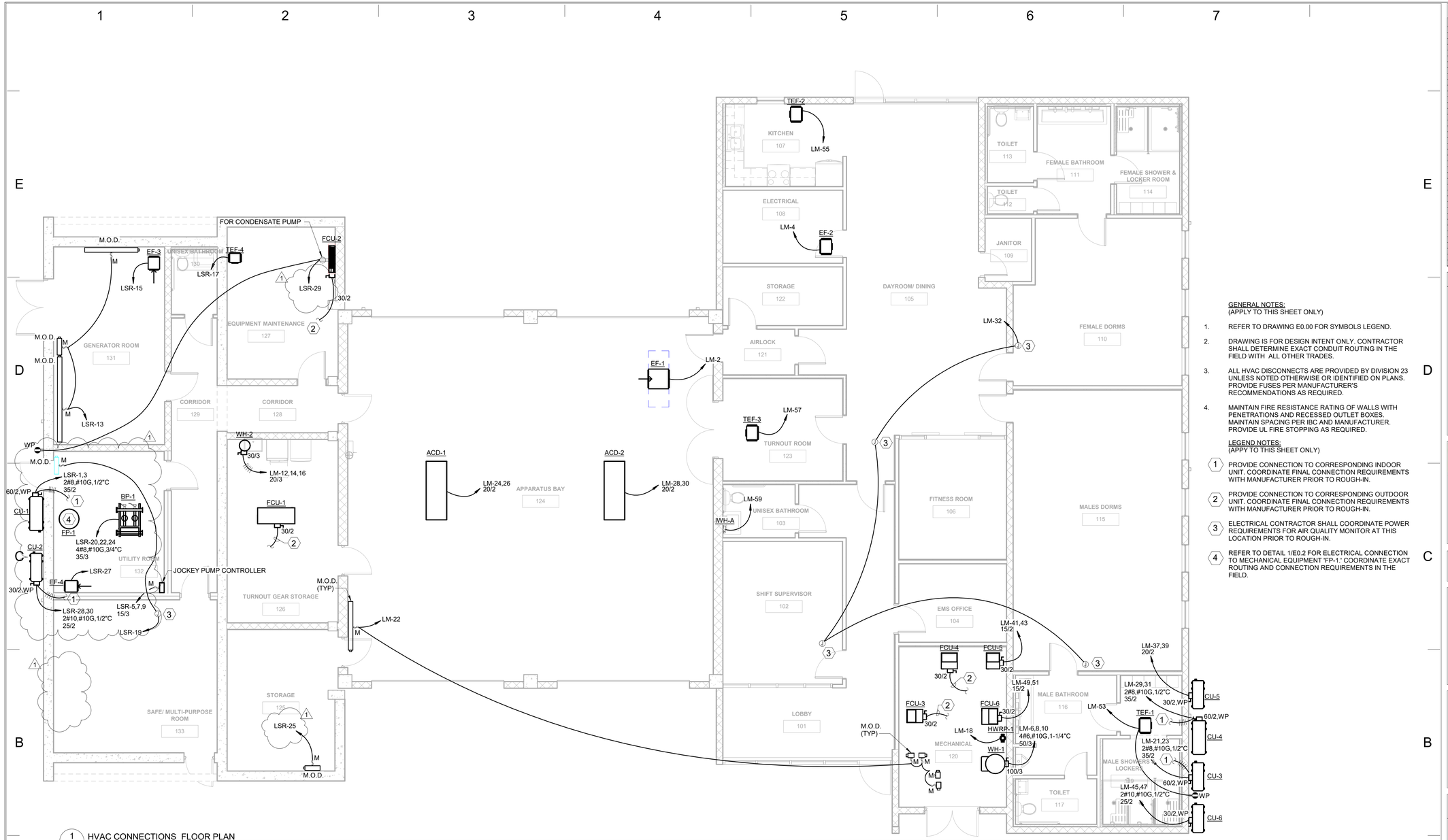
PROJECT NO.: 23-005.D

CONTRACT NO.: -

SHEET NO.: E3.0

LIGHTING FLOOR PLAN

PROFESSIONAL ENGINEER
JASON CLARK
0-56990-1B
U.S. VIRGIN ISLANDS



1 E4.0 HVAC CONNECTIONS FLOOR PLAN
3/16" = 1'-0"

GENERAL NOTES:
(APPLY TO THIS SHEET ONLY)

1. REFER TO DRAWING E0.00 FOR SYMBOLS LEGEND.
2. DRAWING IS FOR DESIGN INTENT ONLY. CONTRACTOR SHALL DETERMINE EXACT CONDUIT ROUTING IN THE FIELD WITH ALL OTHER TRADES.
3. ALL HVAC DISCONNECTS ARE PROVIDED BY DIVISION 23 UNLESS NOTED OTHERWISE OR IDENTIFIED ON PLANS. PROVIDE FUSES PER MANUFACTURER'S RECOMMENDATIONS AS REQUIRED.
4. MAINTAIN FIRE RESISTANCE RATING OF WALLS WITH PENETRATIONS AND RECESSED OUTLET BOXES. MAINTAIN SPACING PER IBC AND MANUFACTURER. PROVIDE UL FIRE STOPPING AS REQUIRED.

LEGEND NOTES:
(APPY TO THIS SHEET ONLY)

1. PROVIDE CONNECTION TO CORRESPONDING INDOOR UNIT. COORDINATE FINAL CONNECTION REQUIREMENTS WITH MANUFACTURER PRIOR TO ROUGH-IN.
2. PROVIDE CONNECTION TO CORRESPONDING OUTDOOR UNIT. COORDINATE FINAL CONNECTION REQUIREMENTS WITH MANUFACTURER PRIOR TO ROUGH-IN.
3. ELECTRICAL CONTRACTOR SHALL COORDINATE POWER REQUIREMENTS FOR AIR QUALITY MONITOR AT THIS LOCATION PRIOR TO ROUGH-IN.
4. REFER TO DETAIL 1/E0.2 FOR ELECTRICAL CONNECTION TO MECHANICAL EQUIPMENT 'FP-1.' COORDINATE EXACT ROUTING AND CONNECTION REQUIREMENTS IN THE FIELD.

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ESTATE FORTUNA (TANGO CO.)
FIRE STATION

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WEST END
ST. THOMAS, U.S. VIRGIN ISLANDS

DATE:	03.14.2025
DRAWN BY:	L. ORTIZ
CHECKED BY:	J. CLARK
APPROVED BY:	J. CLARK

PROJECT NO.: 23-005.D
CONTRACT NO.: -

SHEET NO.: E4.0

HVAC CONNECTIONS FLOOR PLAN

PROFESSIONAL ENGINEER
JASON CLARK
D-56990-HI
U.S. VIRGIN ISLANDS