STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

ENGINEERING DIVISION FOR DIVISION OF STATE PARKS

JOB NO. F70C616E

SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROVEMENTS PHASE 2: PUMP STATION 3 RELOCATION AND FORCE MAIN 3 REPLACEMENT

Sand Island, Honolulu, Oahu, Hawaii

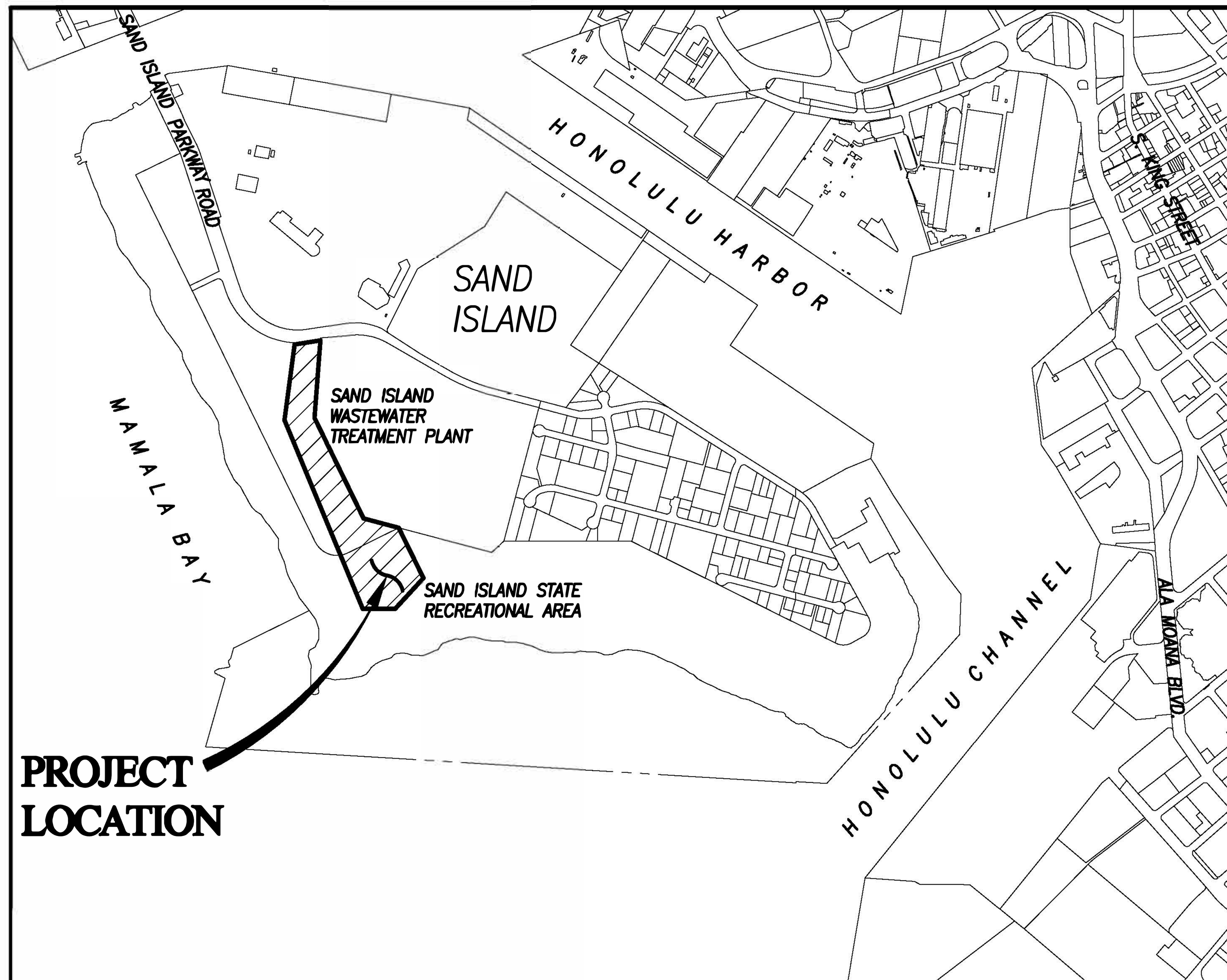
TMK (1) 1-5-041 : 006, 022

Prepared by:

R. M. TOWILL CORPORATION

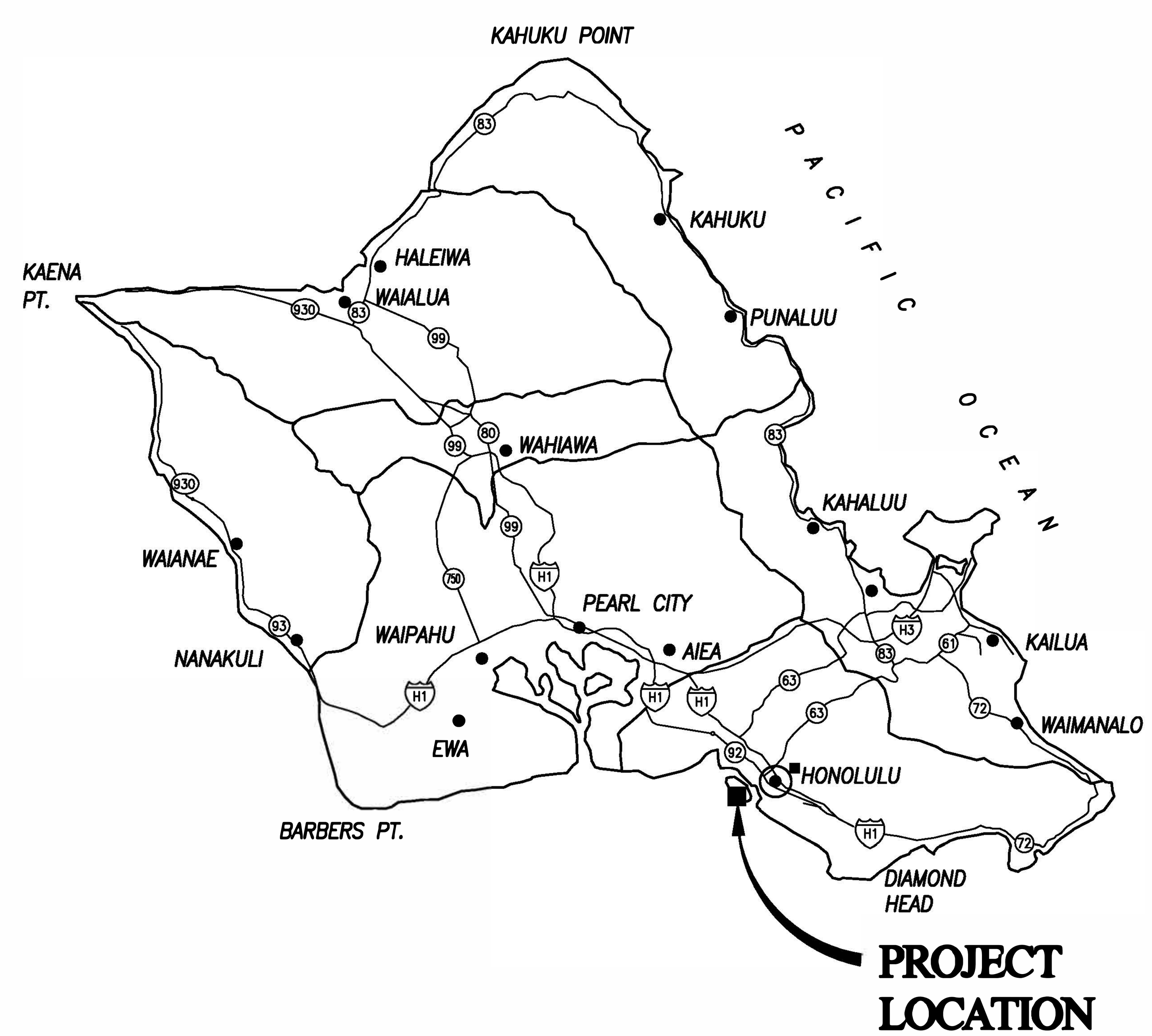
SINCE 1930

Planning • Engineering • Environmental Services • Photogrammetry • Surveying • Construction Management



LOCATION MAP

1" = 1000'   1000' 500' 0 1000' 2000'



OAHU - VICINITY MAP

5 0 5 10
SCALE IN MILES

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APPROVED

[signature] 02/03/21

CARTY S. CHANG, CHIEF ENGINEER
ENGINEERING DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES
DATE

[signature] 02/03/21

CURT A. COTTRELL, ADMINISTRATOR
DIVISION OF STATE PARKS
DEPARTMENT OF LAND AND NATURAL RESOURCES
DATE

CHIEF, ENVIRONMENTAL MANAGEMENT DIVISION
STATE DEPARTMENT OF HEALTH
DATE

GENERAL CONSTRUCTION NOTES

1. ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986, STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984, AND WASTEWATER SYSTEM DESIGN STANDARDS, CITY AND COUNTY OF HONOLULU, JULY 2017, AS AMENDED, OF THE DEPARTMENTS OF PLANNING AND PERMITTING, CITY AND COUNTY OF HONOLULU AND THE COUNTIES OF KAUAI, MAUI AND HAWAII.

2. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.

3. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW INTO EXISTING CITY DRAINAGE SYSTEMS, OR ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.

4. THE CONTRACTOR OF THE PROJECT SHALL BE RESPONSIBLE FOR CONFORMANCE WITH APPLICABLE PROVISIONS OF THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS," AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL."

   THE CONTRACTOR OF THE PROJECT SHALL OBTAIN NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT COVERAGE(S) FOR THE FOLLOWING:

   1. STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES THAT DISTURB ONE (1) ACRE OR MORE, AND
   2. DISCHARGES OF HYDROTESTING EFFLUENT, DEWATERING EFFLUENT, AND WELL DRILLING EFFLUENT TO STATE WATERS.

   IN ACCORDANCE WITH STATE LAW, ALL DISCHARGES RELATED TO PROJECT CONSTRUCTION OR OPERATIONS ARE REQUIRED TO COMPLY WITH STATE WATER QUALITY STANDARDS (HAWAII ADMINISTRATIVE RULES, CHAPTER 11-54). BEST MANAGEMENT PRACTICES SHALL BE USED TO MINIMIZE OR PREVENT THE DISCHARGE OF SEDIMENT, DEBRIS, AND OTHER POLLUTANTS TO STATE WATERS. PERMIT COVERAGE IS AVAILABLE FROM THE DEPARTMENT OF HEALTH, CLEAN WATER BRANCH AT HTTP://HEALTH.HAWAII.GOV/CWB. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING OTHER FEDERAL, STATE, OR LOCAL AUTHORIZATIONS AS REQUIRED BY LAW.

5. CONFINED SPACE. FOR ENTRY BY CITY PERSONNEL, INCLUDING INSPECTORS, INTO A PERMIT REQUIRED, CONFINED SPACE AS DEFINED IN 29 CFR PART 1910.146(B), THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING:
   I. ALL SAFETY EQUIPMENT REQUIRED BY THE CONFINED SPACE REGULATIONS APPLICABLE TO ALL PARTIES OTHER THAN THE CONSTRUCTION INDUSTRY, TO INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:
      A. FULL BODY HARNESSES FOR UP TO TWO PERSONNEL.
      B. LIFELINE AND ASSOCIATED CLIPS.
      C. INGRESS/EGRESS AND FALL PROTECTION EQUIPMENT.
      D. TWO-WAY RADIOS (WALKIE-TALKIES) IF OUT OF LINE-OF-SIGHT.
      E. EMERGENCY (ESCAPE) RESPIRATOR (10 MINUTE DURATION).
      F. CELLULAR TELEPHONE TO CALL FOR EMERGENCY ASSISTANCE.
      G. CONTINUOUS GAS DETECTOR (CALIBRATED) TO MEASURE OXYGEN, HYDROGEN SULFIDE, CARBON MONOXIDE AND FLAMMABLES (CAPABLE OF MONITORING AT A DISTANCE AT LEAST 20-FEET AWAY).
      H. PERSONAL MULTI-GAS DETECTOR TO BE CARRIED BY INSPECTOR.
   II. CONTINUOUS FORCED AIR VENTILATION ADEQUATE TO PROVIDE SAFE ENTRY CONDITIONS.
   III. ONE ATTENDANT/RESCUE PERSONNEL TOPSIDE (TWO, IF CONDITIONS WARRANT IT).

6. PURSUANT TO CHAPTER 6E, HRS, IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATION, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE HONOLULU POLICE DEPARTMENT, AND THE STATE DEPARTMENT OF LAND AND NATURAL RESOURCES-HISTORIC PRESERVATION DIVISION (692-8015).

7. THE EXISTING UTILITIES HAVE BEEN SHOWN ON THESE PLANS INSOFAR AS IT IS POSSIBLE TO DO SO. THEIR LOCATIONS AS SHOWN ARE APPROXIMATE ONLY AND THE CONTRACTOR SHALL MAKE AN INDEPENDENT CHECK ON THE GROUND BY PROBING AND WITH THE VARIOUS UTILITY COMPANIES AND GOVERNMENTAL AGENCIES TO ASCERTAIN THEIR EXACT LOCATIONS.

8. THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES WHETHER SHOWN ON THE PLANS OR NOT. BEFORE DISRUPTING SERVICE OF ANY UTILITY, THE CONTRACTOR SHALL CONTACT DLNR AND THE PARK CARETAKER. DAMAGE TO EXISTING UTILITIES AS A RESULT OF CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST.

9. THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR UTILITIES SUCH AS ELECTRICITY, ETC. REQUIRED FOR HIS OPERATIONS, AND ALL COSTS FOR THESE UTILITIES SHALL BE BORNE BY THE CONTRACTOR.

10. ALL EXISTING UTILITIES TO REMAIN IN USE, WHETHER OR NOT SHOWN ON THE PLANS, SHALL BE PROTECTED AT ALL TIMES BY THE CONTRACTOR DURING CONSTRUCTION UNLESS SPECIFIED ON THE PLANS TO BE ABANDONED. ANY DAMAGE TO THE EXISTING UTILITIES SHALL BE REPAIRED AND PAID FOR BY THE CONTRACTOR.

11. UNLESS RELOCATION IS CALLED FOR ON THE PLANS, EXISTING UTILITIES SHALL REMAIN IN-SERVICE AND IN PLACE. IF RELOCATION OF EXISTING UTILITIES IS REQUIRED FOR THE CONTRACTOR'S CONVENIENCE, INTERRUPTION OF SERVICE SHALL BE KEPT TO A MINIMUM AND SHALL BE DONE AT THE CONTRACTOR'S EXPENSE, AND ONLY WITH THE APPROVAL OF THE ENGINEER.

12. UTILITIES SHALL BE INSTALLED IN ACCORDANCE WITH PROVISIONS OF CHAPTER 22, REVISED ORDINANCES, 1969, AS AMENDED (UNDERGROUND UTILITIES).

13. THE CONTRACTOR SHALL VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION.

14. THE CONTRACTOR SHALL APPLY FOR A PERMIT WITH A NOISE CONTROL PLAN AND OTHER REQUIRED POLLUTION CONTROL PLANS.

15. IF THERE ARE ANY FUEL SPILLAGES, EXISTING LEAKS, ETC. FOUND DURING CONSTRUCTION, REPORT THE FOREGOING TO THE HAZARD EVALUATION AND EMERGENCY RESPONSE UNIT (PH. NO. 586-4249) OF THE DEPARTMENT OF HEALTH. FOR NON-WORKING HOURS, CALL THE STATE HOSPITAL OPERATOR (PH. NO. 247-2191).

16. NO BLASTING SHALL BE PERMITTED ON THIS PROJECT.

17. THE CONTRACTOR, AT HIS EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCES. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.

18. THE EXISTING IMPROVEMENTS ON THE PREMISES AND IN THE ADJACENT AREA THAT ARE NOT TO BE REMOVED, SHALL BE PRESERVED AND PROTECTED. ANY AND ALL DAMAGES RESULTING FROM THE CONTRACTOR'S CONSTRUCTION OPERATION SHALL BE REPLACED AND REPAIRED TO ORIGINAL OR BETTER CONDITION, TO THE SATISFACTION OF THE OWNER.

19. DURING NON-WORK HOURS, ALL TRENCHES SHALL BE COVERED WITH NON-SKID STEEL PLATES.

SEWER NOTES

1. ALL SEWER CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE CITY'S "STANDARD SPECIFICATIONS," SEPT. 1986, THE DEPARTMENT OF ENVIRONMENTAL SERVICES "WASTEWATER SYSTEM DESIGN STANDARDS," JULY 2017, AND "WASTEWATER SYSTEM STANDARD DETAILS," JULY 2017, CURRENT CITY PRACTICES AND REVISED ORDINANCES OF HONOLULU, 1990 AS AMENDED.

2. IN THE EVENT THAT ANY CHANGE IN ALIGNMENT OR GRADE FOR THE PROPOSED SEWERS ARE REQUIRED DUE TO UNFORESEEN CONFLICT WITH OTHER UTILITIES, THE ENGINEER IN CHARGE OR THE MAKER OF THE PLANS SHALL BE RESPONSIBLE FOR THE REQUIRED CHANGES.

3. CRUSHED ROCK CRADLE IS PERMITTED WHERE SOIL IS STABLE. IN AREAS OF UNSTABLE SOIL, THE MAKER OF THE PLANS AND THE CONSTRUCTION ENGINEER WILL DETERMINE THE PIPE SUPPORT REQUIRED.

4. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS RESEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF THE FACILITIES, INCLUDING AND AFFECTING SEWER LINES, IN THE PRESENCE OF THE DPP INSPECTOR AND EXERCISE PROPER CARE IN EXCAVATING THE AREA. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGED UTILITIES.

5. SEWER LATERAL SHALL BE CLEAR OF AND NOT CONFLICTING WITH ANY OTHER UTILITY. MINIMUM HORIZONTAL AND VERTICAL CLEARANCES SHALL BE STRICTLY OBSERVED AND FOLLOWED.

6. SLOPE FOR SEWER LATERALS SHALL BE NO LESS THAN 1.00% UNLESS OTHERWISE NOTED.

7. BUILDING PLUMBING FACILITIES SHALL BE CONTROLLED BY SEWER LATERAL INVERTS.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS SEWER SERVICE TO ALL AFFECTED AREAS DURING CONSTRUCTION.

9. PROPERTY OWNERS WITH LATERALS AFFECTED BY THE CONSTRUCTION SHALL BE NOTIFIED PRIOR TO COMMENCEMENT OF ANY WORK ON THE LATERALS.

10. THE CONTRACTOR SHALL VERIFY ALL EXISTING SEWER LATERAL LOCATIONS WHETHER SHOWN OR NOT SHOWN ON PLANS PRIOR TO COMMENCING WITH ANY OF THE WORK AND SHALL NOT ASSUME THAT WHERE NO LATERALS ARE SHOWN, NONE EXIST. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGED UTILITIES. THE LOCATION AND DEPTHS OF ALL EXISTING SEWER LATERALS ARE APPROXIMATE.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SEWAGE SPILLS CAUSED DURING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE STATE DEPARTMENT OF HEALTH AND UTILIZE APPROPRIATE SAMPLING AND ANALYZING PROCEDURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PUBLIC NOTIFICATIONS AND PRESS RELEASES.

12. THE CONTRACTOR SHALL INSTALL "RAINSTOPPER" MANHOLE INSERTS IN ALL SEWER MANHOLES WITH TYPE "SA" FRAME AND COVER.

13. ALL DROP AND SHALLOW DROP SEWER MANHOLES SHALL BE LINED WITH EPOXY LINERS. ALSO IF THE VELOCITY EXCEEDS TEN (10) FEET PER SECOND (FPS), THE SEWER MANHOLE SHALL BE EPOXY LINED.

14. ALL SEWER PIPE JOINTS WITHIN EASEMENTS SHALL BE WRAPPED WITH GEOTEXTILE ROOT BARRIER.

15. SEWER PIPES THIRTY (30) INCHES AND LARGER SHALL BE OF CORROSION RESISTANT MATERIAL OR PROTECTED INTERNALLY WITH LINING.

16. S4C PIPE CRADLE SEALS SHALL BE INSTALLED TEN (10) FEET FROM ALL SEWER MANHOLES TO PREVENT SOIL MIGRATION. SEE DETAIL ON SHEET C014.

17. GEOTEXTILE FABRIC TO ENVELOP THE PIPE CRADLE AND SELECT BACKFILL MATERIAL SHALL BE PROVIDED WHERE WATER OR UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED.

18. ALL NEW PVC SEWER MAINS SHALL PASS A MANDREL TEST AS A CONDITION OF ACCEPTANCE. THE MANDREL DIAMETER SHALL BE 95% OR MORE OF THE INSIDE DIAMETER OF THE PIPE BEING TESTED. SEWER MAIN MAY NOT BE VIBRATED IN ORDER TO PASS MANDREL TEST.

19. PRIOR TO FINAL ACCEPTANCE ALL SEWER LINES INSTALLED SHALL BE FLUSHED WITH WATER AND ANY ACCUMULATED CONSTRUCTION DEBRIS AND OTHER FOREIGN MATERIALS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR.

20. CONFINED SPACE. FOR ENTRY BY CITY PERSONNEL, INCLUDING INSPECTORS, INTO A PERMIT REQUIRED CONFINED SPACE AS DEFINED IN 29 CFR PART 1910.146(B), THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING:
   I. ALL SAFETY EQUIPMENT REQUIRED BY THE CONFINED SPACE REGULATIONS APPLICABLE TO ALL PARTIES OTHER THAN THE CONSTRUCTION INDUSTRY, TO INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:
      A. FULL BODY HARNESSES FOR UP TO TWO PERSONNEL.
      B. LIFELINE AND ASSOCIATED CLIPS.
      C. INGRESS/EGRESS AND FALL PROTECTION EQUIPMENT.
      D. TWO-WAY RADIOS (WALKIE-TALKIES) IF OUT OF LINE-OF-SIGHT.
      E. EMERGENCY (ESCAPE) RESPIRATOR (10 MINUTE DURATION).
      F. CELLULAR TELEPHONE TO CALL FOR EMERGENCY ASSISTANCE.
      G. CONTINUOUS GAS DETECTOR (CALIBRATED) TO MEASURE OXYGEN, HYDROGEN SULFIDE, CARBON MONOXIDE AND FLAMMABLES (CAPABLE OF MONITORING AT A DISTANCE AT LEAST 20-FEET AWAY).
      H. PERSONAL MULTI-GAS DETECTOR TO BE CARRIED BY INSPECTOR.
   II. CONTINUOUS FORCED AIR VENTILATION ADEQUATE TO PROVIDE SAFE ENTRY CONDITIONS.
   III. ONE ATTENDANT/RESCUE PERSONNEL TOPSIDE (TWO, IF CONDITIONS WARRANT IT).

21. WHEN CONNECTING TO A LIVE SEWER LINE, THE CONTRACTOR SHALL ABIDE BY ALL CONDITIONS THAT THE STATE DEPARTMENT OF HEALTH SETS FORTH TO MITIGATE ANY WASTEWATER SPILL THAT MAY OCCUR. THE CONTRACTOR SHALL INFORM THE CITY INSPECTOR FIVE (5) WORKING DAYS PRIOR TO THE ACTUAL CONNECTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND PENALTIES DUE TO ANY SPILLS RESULTING FROM THE CONNECTION.

22. NO RUNGS SHALL BE INSTALLED INSIDE NEW SEWER MANHOLES.

23. FOR SEWER MANHOLE ADJUSTMENTS UPWARD LESS THAN 3", SEE STD DETAIL S-25. FOR SMH ADJUSTMENTS UPWARD GREATER THAN 3" OR FOR ANY ADJUSTMENTS DOWNWARD, RECONSTRUCT SMH TOP FROM BELOW THE CONE SECTION.

24. CONTRACTOR SHALL MAINTAIN VISIBILITY AND MAINTENANCE ACCESS TO LIVE SEWER MANHOLE LOCATIONS AT ALL TIMES, INCLUDING DURING NON-WORK HOURS AND PAVING OPERATIONS.

25. CONTRACTOR SHALL USE MANHOLE DEBRIS CATCHING DEVICE WHEN PERFORMING MANHOLE HEIGHT ADJUSTMENT WORK AND REMOVE ANY CONSTRUCTION DEBRIS THAT HAS FALLEN INTO THE MANHOLE. DISPOSAL OF CONSTRUCTION DEBRIS IN THE SEWER SYSTEM IS STRICTLY PROHIBITED.

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANNY Y.M. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 11253-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE APRIL 30, 2020 LIC. EXP. DATE

"OBSERVATION OF CONSTRUCTION" IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

Planning - Engineering - Environmental Services - Photogrammetry - Surveying - Construction Management

R. M. TOWILL CORPORATION

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Department of Land and Natural Resources

SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV

PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT

Sand Island, Honolulu, Oahu, Hawaii

CONSTRUCTION NOTES - 1

DESIGNED:	AM/JB	SUBMITTED:	
DRAWN:	SF	DATE:	
CHECKED:		SCALE:	
APPROVED:			DRAWING NO. C001

Carty Chang
E-signed 2021-02-03 09:39AM HST
carty.s.chang@hawaii.gov
State of Hawaii
Chief Engineer

JOB NO. F70C616E SHEET NO. 2 OF 30 SHEETS

Fri, 29 Jan 2021 - 3:42pm
K:\wk\02948 05 Sand Island Park Sewer Sig Phase 2\Drawings\Construction Dwgs\Phase 2 - PS 3 and FM 3 New Alignment\2 PHE Construction Notes.dwg

SPECIAL PROVISIONS FOR PVC PIPING SEWER PIPE

1. POLYVINYL CHLORIDE (PVC) PLASTIC SEWER PIPE AND APPURTENANCES USED ON THIS PROJECT SHALL CONFORM TO THE REQUIREMENTS OF SECTION 21 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION DATED SEPTEMBER 1986, EXCEPT AS MODIFIED HEREIN.

   A. GENERAL. PVC GRAVITY SEWER PIPE SHALL CONFORM TO THE REQUIREMENTS OF C-900/C-905. (DR 18 MINIMUM WALL THICKNESS)

   B. ACCEPTANCE. THE BASIS FOR ACCEPTANCE SHALL BE THE INSPECTION OF PIPE, FITTINGS AND COUPLINGS, THE TESTS SPECIFIED HEREIN AND IN SECTION 21, AND COMPLIANCE WITH THE SPECIFICATIONS. AT THE TIME OF MANUFACTURE, EACH LOT OF PIPE AND FITTINGS SHALL BE INSPECTED FOR DEFECTS AND TESTED FOR IMPACT, STIFFNESS AND FLATTENING IN ACCORDANCE WITH ASTM D3034. THE ENGINEER MAY REQUIRE THE CERTIFICATION BY THE MANUFACTURER THAT THE TEST RESULTS COMPLY WITH SPECIFICATION REQUIREMENTS. WHEN THE PIPE IS DELIVERED TO THE JOB SITE, THE ENGINEER MAY REQUIRE THE CONTRACTOR TO PROVIDE ADDITIONAL TESTING TO INSURE THE QUALITY OF THE PIPE AT NO EXPENSE TO THE STATE. PIPE WHICH IS NOT INSTALLED WITHIN 120 DAYS OF THE LATEST FACTORY TEST SHALL NOT BE USED WITHOUT PRIOR APPROVAL OF THE ENGINEER.

   C. SELECTION OF TEST PIPE. WHEN TESTING IS REQUIRED BY THE ENGINEER, ONE TEST PIPE SHALL BE SELECTED AT RANDOM BY THE ENGINEER FROM EACH 1200 LINEAR FEET OR FRACTION THEREOF OF EACH SIZE OF PIPE DELIVERED TO THE JOB SITE BUT NO LESS THAN ONE TEST PIPE PER LOT. A LOT SHALL BE DEFINED AS PIPE HAVING THE SAME IDENTIFICATION MARKING. THE LENGTH OF SPECIMEN OF EACH SELECTED PIPE SHALL BE A MINIMUM OF 8 FEET.

   D. CELL CLASSIFICATION. PIPE SHALL BE MADE OF PVC PLASTIC HAVING A CELL CLASSIFICATION OF 12454-B, 13364-A, OR 13364-B AS DEFINED IN ASTM D1784. THE FITTINGS SHALL BE MADE OF PVC PLASTIC HAVING A CELL CLASSIFICATION 12454-B, 12454-C, OR 13343-C. PVC COMPOUNDS OF OTHER CELL CLASSIFICATIONS SHALL BE PRE-QUALIFIED BY THE MANUFACTURER.

   E. JOINTS. PIPE JOINTS SHALL BE BELL AND SPIGOT TYPE WITH ON ELASTOMERIC GASKET. THE GASKETED JOINTS SHALL BE MANUFACTURED WITH A SOCKET CONFIGURATION WHICH WILL PRECLUDE IMPROPER INSTALLATION OF THE GASKET AND WILL INSURE THE GASKET REMAINS IN PLACE DURING THE JOINING OPERATION. ALL PIPES SHALL HAVE A HOME MARK ON THE SPIGOT END TO INDICATE PROPER PENETRATION WHEN THE JOINT IS MADE.

   F. IDENTIFICATION MARKS. ALL PIPE FITTING AND COUPLINGS SHALL BE CLEARLY MARKED AT AN INTERVAL NOT TO EXCEED 5 FEET AS FOLLOWS:
      (1) NOMINAL PIPE DIAMETER.
      (2) PVC CELL CLASSIFICATION.
      (3) COMPANY, PLANT, SHIFT, ASTM, SDR, AND DATE DESIGNATIONS.
      (4) SERVICE DESIGNATION AND LEGEND.

   G. DIMENSIONS AND TOLERANCES:

TABLE 1 – PIPE DIMENSION (INCHES)

NOMINAL SIZE	AVERAGE O.D.	TOLERANCE ON AVERAGE	MINIMUM WALL THICKNESS	APPROX. WT./20' LENGTH (LBS)
6	6.90	±0.011	0.383	104
8	9.05	±0.012	0.503	178
10	11.10	±0.015	0.617	268
12	13.20	±0.018	0.733	382

   H. CHEMICAL RESISTANCE. THE PVC COMPOUND FOR CELL CLASSIFICATIONS NOT SPECIFICALLY IDENTIFIED IN ITEM D ABOVE SHALL BE PREQUALITIED BY THE PIPE MANUFACTURER BY MEETING THE CHEMICAL RESISTANCE TESTS WHICH FOLLOW. COMPOUND SAMPLES AND MOLDED TEST SPECIMENS SHALL BE PREPARED IN ACCORDANCE WITH ASTM D543.

   TENSILE AND IZOD IMPACT EXPOSURE SPECIMENS SHALL BE IMMERSED IN THE SOLUTIONS SPECIFIED IN TABLE 2 FOR A PERIOD OF 112 DAYS. TEST SPECIMENS SHALL BE CONDITIONED TO CONSTANT WEIGHT AT 110°F (43.3°C) BEFORE AND AFTER SUBMERSION. THE SOLUTIONS SHALL BE KEPT AT A TEMPERATURE OF 77°F ±5°F (24°C ±3°C). AT 28-DAY INTERVALS, SELECTED SPECIMENS SHALL BE REMOVED, WASHED, SURFACE DRIED AND TESTED.

TABLE 2 – TEST SOLUTIONS

CHEMICAL SOLUTION	CONCENTRATION (%)
SULFURIC ACID	20*
SODIUM HYDROXIDE	5
AMMONIUM HYDROXIDE	5*
NITRIC ACID	1*
FERRIC CHLORIDE	1
SOAP	0.1
DETERGENT (LINEAR ALKYL BENZYL SULFONATE OR LAS)	0.1
BACTERIOLOGICAL	BOD NOT LESS THAN 700 PPM.

* VOLUMETRIC PERCENTAGES OF CONCENTRATED REAGENTS OF C.P. GRADE.

   WEIGHT CHANGE SPECIMENS SHALL BE 2 INCHES IN DIAMETER AND MAY BE MOLDED DISCS OR DISCS CUT FROM THE PIPE WALL. SPECIMENS SHALL BE CONDITIONED FOR SEVEN DAYS AT 43° ±2°C, COOLED IN A DESICCATOR FOR THE THREE HOURS AT 23° ±2°C, WEIGHED, AND THEN IMMERSED IN THE SOLUTIONS. AT 4 WEEK INTERVALS, SELECTED SPECIMENS SHALL BE REMOVED, WASHED, SURFACE DRIED AND WEIGHED. THESE SAME SPECIMENS SHALL THEN BE RECONDITIONED FOR SEVEN DAYS AT 43° ±2°C, COOLED IN A DESICCATOR FOR THREE HOURS AT 23° ±2°C AND AGAIN WEIGHED.

   INITIAL AND PAST EXPOSURE SPECIMENS SHALL MEET THE FOLLOWING REQUIREMENTS WHEN TESTED AT 23° ±2°C:

PROPERTY	ASTM TEST METHOD	CELL CLASS MINIMUM VALUES 12454	13343	13364
TENSILE STRENGTH (YIELD), PSI	D 638	7000	6000	6000
IMPACT STRENGTH FT-LBS/IN.	D 256 METHOD A	0.65	1.5	1.5
WEIGHT CHANGE, %	D 543	1.5	1.5	1.5

   IF ANY SPECIMEN FAILS TO MEET THE REQUIREMENTS AT ANY TIME DURING THE 112 DAY EXPOSURE PERIOD, THE MATERIAL WILL BE SUBJECT TO REJECTION.

   I. TRENCH EXCAVATION. TRENCHES FOR PVC SEWER PIPE SHALL BE EXCAVATED AND PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 11 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION EXCEPT AS MODIFIED HEREIN.

      (1) OVER EXCAVATION. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE EQUAL TO THE OUTSIDE DIAMETER OF THE PIPE PLUS 18-INCHES FOR PIPE UP TO 12" (I.D.). IF THE TRENCH EXCAVATION EXCEEDS THE COMPUTED MAXIMUM ALLOWABLE TRENCH WIDTH WHETHER BY EXCAVATION, CAVE-IN, OR BY GROUND MOVEMENT, THE CONTRACTOR SHALL PROVIDE AT HIS OWN EXPENSE ADDITIONAL BEDDING, ANOTHER TYPE OF BEDDING, AND/OR A HIGHER STRENGTH OF PIPE DESIGNATED BY THE ENGINEER. WHERE SHORING IS REQUIRED, THE ALLOWABLE WIDTH OF THE TRENCH SHALL BE INCREASED ONLY BY THE THICKNESS OF THE SHEATHING.

   J. PIPE BEDDING. WHERE UNSUITABLE MATERIAL IS ENCOUNTERED AT THE SUBGRADE AND ADDITIONAL EXCAVATION IS REQUIRED, THE VOID CREATED BY THE ADDITIONAL EXCAVATION SHALL BE FILLED AND COMPACTED WITH BEDDING MATERIAL SPECIFIED ON THE PLANS OR SPECIAL PROVISIONS. WHERE CONCRETE IS SPECIFIED TO BED THE PIPE, THE TOP OF THE CONCRETE SHALL BE CONSIDERED AS THE TOP OF THE BEDDING.

   BEDDING MATERIAL SHALL CONSIST OF ONE OF THE FOLLOWING:

      (1) BEACH SAND.
      (2) NO. 8 OR NO. 67 AGGREGATE CONFORMING TO THE GRADATION REQUIREMENTS OF ASTM C33.
      (3) 3/8" FILTER AGGREGATE.
      (4) NATIVE FREE-DRAINING GRANULAR MATERIAL HAVING A MINIMUM SAND EQUIVALENT OF 30 OR HAVING A COEFFICIENT OF PERMEABILITY GREATER THAN 0.001 CENTIMETER PER SECOND.
      (5) OTHER MATERIAL APPROVED BY THE ENGINEER.

   BEDDING MATERIAL SHALL FIRST BE PLACED SO THAT THE PIPE IS SUPPORTED FOR THE FULL LENGTH OF THE BARREL WITH FULL BEARING ON THE BOTTOM SEGMENT OF THE PIPE EQUAL TO A MINIMUM OF 0.4 TIMES THE OUTSIDE DIAMETER OF THE BARREL. IF THE PIPE IS TO BE LAID IN A ROCK EXCAVATION, THE ROCK SHALL BE REMOVED SUCH THAT NO RIBS, ROCKS, OR SOLID PROJECTIONS SHALL BE WITHIN 6 INCHES OF THE SEWER PIPE HORIZONTALLY AND THERE SHALL BE AT LEAST 4 INCHES OF BEDDING BELOW THE PIPE.

   COMPACTION OF THE BEDDING FROM THE BOTTOM OF THE PIPE TO 12 INCHES ABOVE THE PIPE BARREL BY JETTING WILL BE PERMITTED PROVIDED THAT THE FOUNDATION MATERIAL WILL NOT SOFTEN OR BE OTHERWISE DAMAGED BY THE APPLIED WATER. FLOODING OR PONDING METHODS OF ACHIEVING THE REQUIRED RELATIVE DENSITY WILL NOT BE PERMITTED. THE SIZE AND LENGTH OF JET PIPE, QUANTITIES AND PRESSURE OF WATER, AND JETTING LOCATIONS SHALL BE SUFFICIENT TO COMPACT THE BEDDING TO 87% MINIMUM RELATIVE DENSITY. COMPACTION OF THE BACKFILL FROM 12 INCHES ABOVE THE PIPE BARREL TO THE FINISH SURFACE SHALL CONFORM TO THE REQUIREMENTS OF SECTION 11.4 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.

   K. MANDREL TEST OF PVC PIPE. A MANDREL TEST SHALL BE PERFORMED NO SOONER THAN 30 DAYS AFTER THE TRENCH BACKFILL IS COMPLETED. <u>IN ROADWAY AREAS THE 30-DAY PERIOD SHALL BEGIN AFTER INSTALLATION AND COMPACTION OF BEDDING BACKFILL AND SUBBASE TO WITHIN 2 FEET OF THE FINISHED PAVEMENT GRADE.</u> A RIGID MANDREL SHALL BE PULLED THROUGH THE PIPE BY HAND BETWEEN ADJACENT MANHOLES TO MEASURE FOR OBSTRUCTIONS (DEFLECTIONS, JOINT OFFSETS AND LATERAL PIPE INTRUSIONS). THE MANDREL SHALL HAVE A CROSS SECTION EQUIVALENT TO A CIRCLE HAVING A DIAMETER AT LEAST 95 PERCENT OF THE SPECIFIED AVERAGE INSIDE DIAMETER OF THE PIPE. THE MINIMUM LENGTH OF THE CIRCULAR PORTION OF THE MANDREL SHALL BE EQUAL TO THE NOMINAL DIAMETER OF THE PIPE. THIS TEST SHALL BE PERFORMED BY THE CONTRACTOR IN THE PRESENCE OF THE ENGINEER. ALL MATERIAL, EQUIPMENT AND LABOR REQUIRED TO PERFORM THE TEST SHALL BE PROVIDED BY THE CONTRACTOR AT NO COST TO THE STATE. ANY SECTION OF PIPE THAT FAILS TO PERMIT PASSAGE OF THE MANDREL WILL NOT BE ACCEPTED UNTIL PROPERLY REPAIRED OR REPLACED AND RETESTED.

2. BEDDING FOR PVC PIPE SEWER SHALL BE CLASS "B" AS SHOWN ON S-47 OF THE STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION UNLESS OTHERWISE NOTED.

3. THE MAXIMUM DESIGN DEFLECTION (FLATTENING) FOR PLASTIC PIPE SHALL BE 5 PERCENT. THE MAXIMUM SDR (STANDARD DIMENSION RATIO OF PIPE OUTSIDE DIAMETER TO PIPE WALL THICKNESS) SHALL BE 35.

4. SPECIAL WATERTIGHT MANHOLE COUPLINGS PER STANDARD DETAIL S-48 WILL BE REQUIRED FOR ALL MANHOLE CONNECTIONS. COUPLINGS MAY BE CAST DIRECTLY INTO CAST-IN-PLACE MANHOLES OR GROUTED INTO PRECAST CONCRETE MANHOLES WITH NON-SHRINK OR EXPANSION TYPE GROUT.

5. FOR CONNECTIONS OF PVC LATERAL SEWERS TO MAINS OF DIFFERENT MATERIALS, AN APPROVED SADDLE WYE FITTING CONSTRUCTED OF THE SAME MATERIAL AS THE MAIN LINE SHALL BE INSTALLED. CONNECTION TO THE SADDLE FITTING SHALL BE MADE BY MEANS OF AN APPROVED FLEXIBLE RUBBER COUPLING IN ACCORDANCE WITH THE COUPLING MANUFACTURER'S INSTALLATION RECOMMENDATIONS OR BY OTHER MEANS ACCEPTABLE TO THE ENGINEER.

6. PVC PIPE SHALL BE LIMITED TO USE IN AGRICULTURAL, RESIDENTIAL AND APARTMENT ZONED AREAS AND IN SIZES FROM 6 INCHES TO 12 INCHES IN DIAMETER.

PUBLIC HEALTH, SAFETY AND CONVENIENCE

1. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH AND SAFETY AND ENVIRONMENTAL QUALITY.

2. THE CONTRACTOR AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. THE CITY SHALL REQUIRE SUPPLEMENTARY MEASURES AS NECESSARY.

3. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, BARRICADES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE, AND SAFETY OF THE PUBLIC.

ABBREVIATIONS

APPROX	APPROXIMATE
BB	BOTTOM OF BANK
BLK	BLOCK
BMP	BEST MANAGEMENT PRACTICES
BW	BOTTOM OF WALL
CIPP	CURED IN PLACE PIPE
CLF	CHAIN LINKED FENCE
℄	CENTER LINE
C&C / CITY	CITY AND COUNTY OF HONOLULU
CO	CLEAN OUT
CONC	CONCRETE
CY	CUBIC YARD
D/DIA	DIAMETER
DET	DETAIL
DLNR	DEPARTMENT OF LAND AND NATURAL RESOURCES
DPP	DEPARTMENT OF PLANNING AND PERMITTING
DPW	DEPARTMENT OF PUBLIC WORKS
EX	EXISTING
fps	FEET PER SECOND
FT	FEET
H	HEIGHT
I.D.	INNER DIAMETER
INV	INVERT
LF	LINEAR FEET
MAINT	MAINTAINED
mgd	MILLION GALLONS PER DAY
MIN	MINIMUM
N	MANNING'S N
OC	ON CENTER
⅊	PROPERTY LINE
PERF	PERFORATED
PVC	POLYVINYL CHLORIDE
Qa	AVAILABLE FLOW
Qr	REQUIRED FLOW
S	SLOPE / SEWER / SPREAD
SHT	SHEET
SL	SLOPE / SEWER LINE
SMH	SEWER MANHOLE
STA	STATION
T	TOP
TB	TOP OF BANK
TP	TOP OF PIPE
TW	TOP OF WALL
TYP	TYPICAL
Va	AVAILABLE VELOCITY
Vr	REQUIRED VELOCITY

ABBREVIATIONS FOR SEWER FLOW DATA

QA = AVAILABLE FLOW; FULL FLOW CAPACITY OF THE SEWER LINE

QR = REQUIRED FLOW, PEAKFLOW

N = MANNING'S N

S = SLOPE

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 11253-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

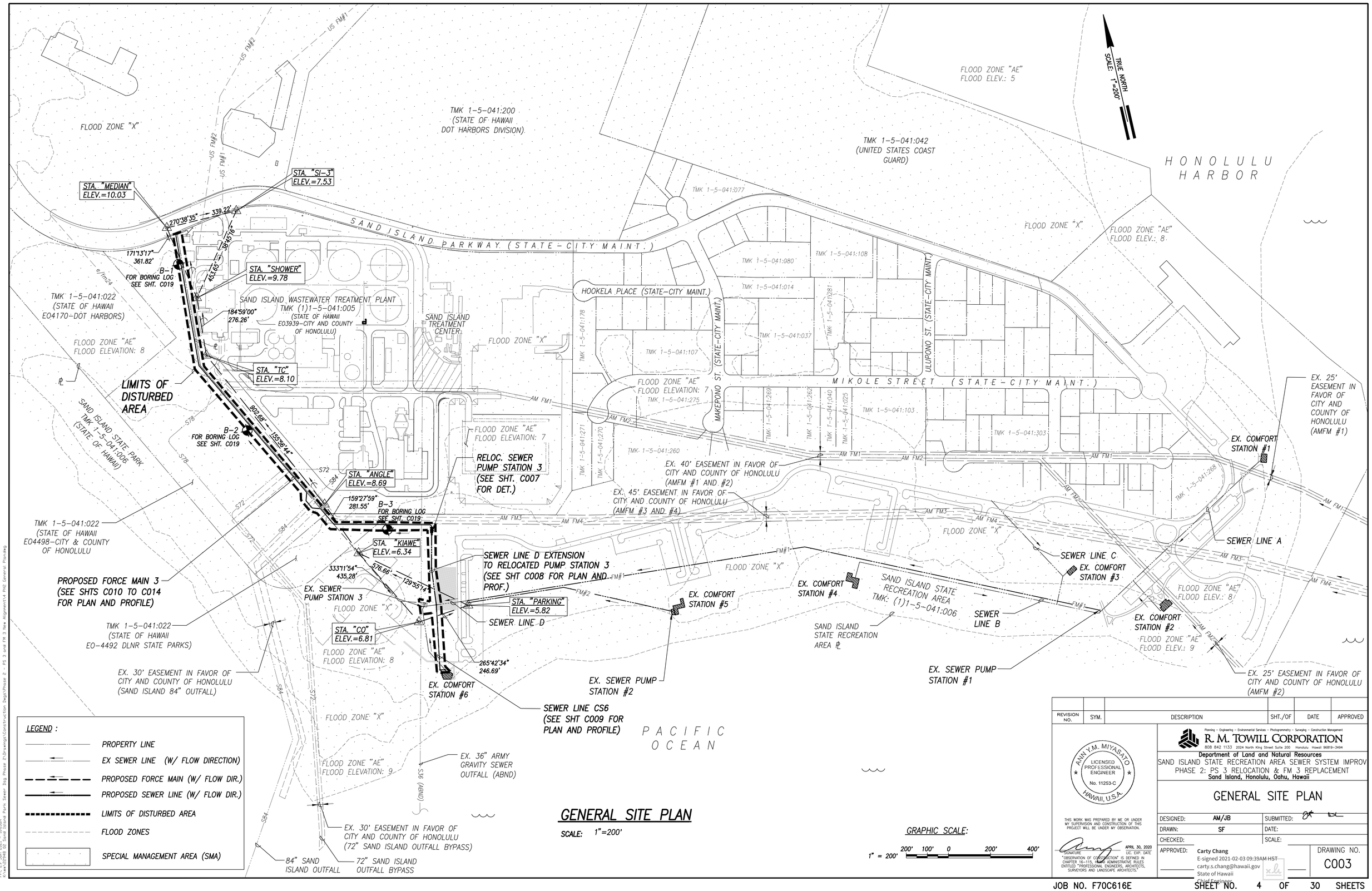
"OBSERVATION OF CONSTRUCTION" IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

Planning – Engineering – Environmental Services – Photogrammetry – Surveying – Construction Management
R. M. TOWILL CORPORATION
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494

Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

CONSTRUCTION NOTES – 2 AND LEGEND & ABBREVIATIONS

DESIGNED:	AM/JB	SUBMITTED:	
DRAWN:	SF	DATE:	
CHECKED:		SCALE:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO.	C002



LEGEND :

- PROPERTY LINE
- EX SEWER LINE (W/ FLOW DIRECTION)
- PROPOSED FORCE MAIN (W/ FLOW DIR.)
- PROPOSED SEWER LINE (W/ FLOW DIR.)
- LIMITS OF DISTURBED AREA
- FLOOD ZONES
- SPECIAL MANAGEMENT AREA (SMA)

GENERAL SITE PLAN

SCALE: 1"=200'

GRAPHIC SCALE:

1" = 200' 200' 100' 0 200' 400'

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO
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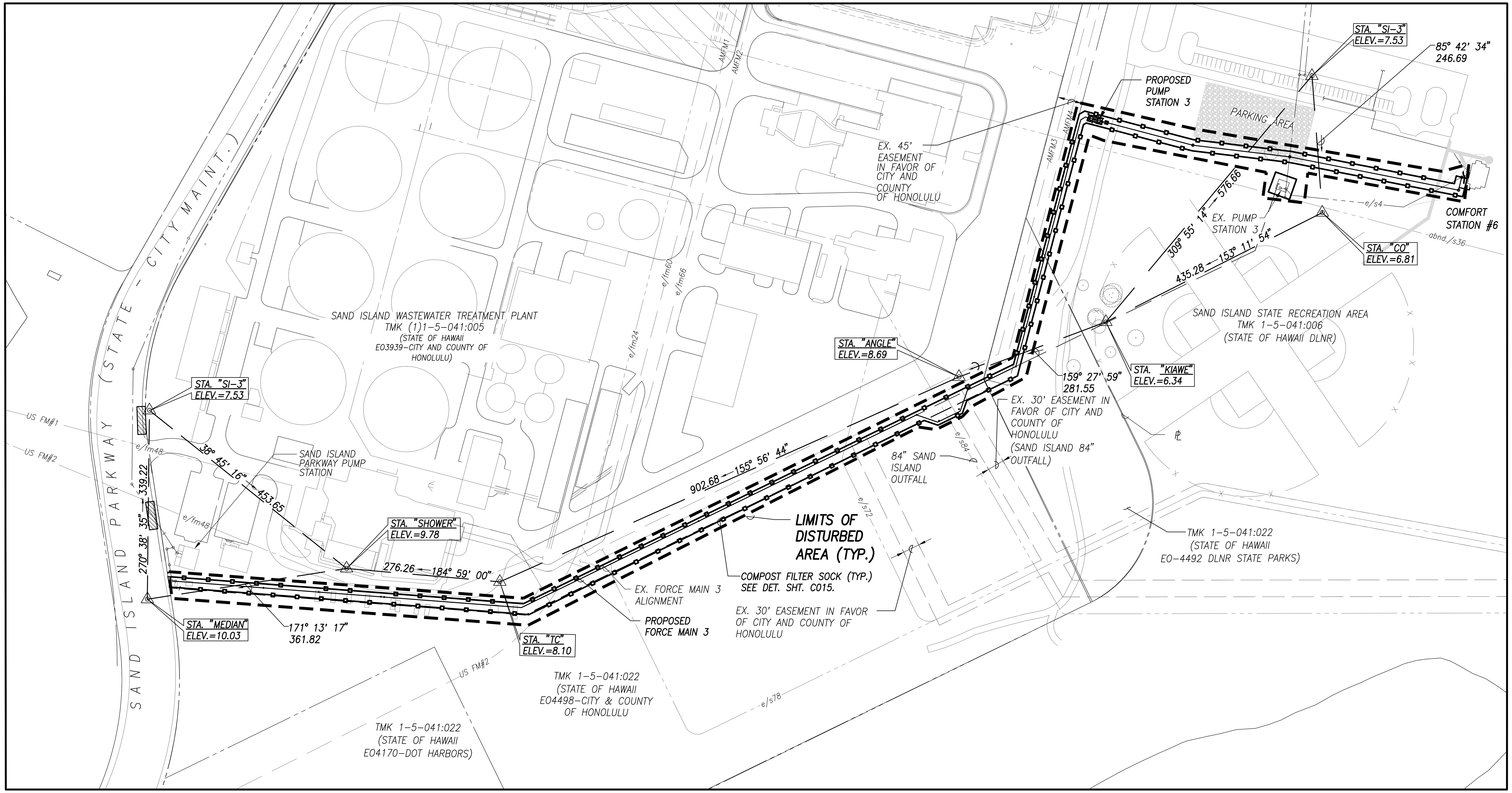
Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

GENERAL SITE PLAN

DESIGNED:	AM/JB	SUBMITTED:	
DRAWN:	SF	DATE:	
CHECKED:		SCALE:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO.	C003

JOB NO. F70C616E SHEET NO. 4 OF 30 SHEETS

Fri, 29 Jan 2021 - 10:03am
K:\w\20948 02 Sand Island Park, Sewer Bdg Phase 2\Drawing\Construction Dgn\Phase 2 - PS 3 and FM 3 New Alignment\4 PNO General Plan.dwg



TRUE NORTH
SCALE: 1"=200'

LEGEND:

- PROPERTY LINE
- EX FORCE MAIN
- EX SEWER LINE
- LIMITS OF DISTURBED AREA
- COMPOST FILTER SOCK
- CATCH BASIN SEDIMENT FILTER

GRAPHIC SCALE:
1" = 200' 200' 100' 0 200' 400'

EROSION CONTROL PLAN

SCALE: 1" = 100'

NOTES:

1) SEE SHT. C015 FOR BMP AND EROSION CONTROL NOTES.

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

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No. 11253-C
HAWAII, U.S.A.

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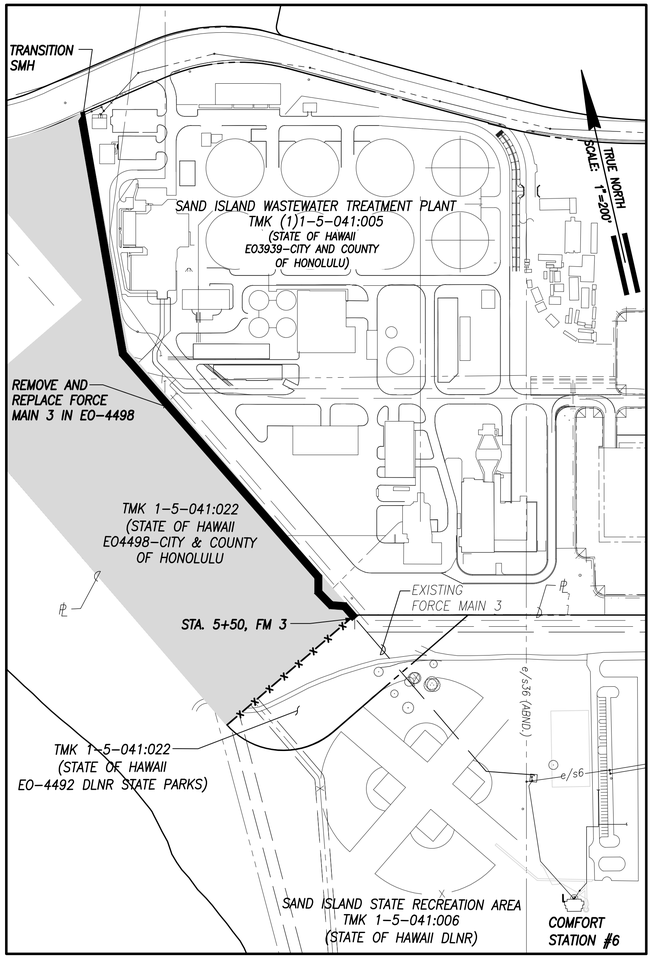
Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

EROSION CONTROL PLAN – 1

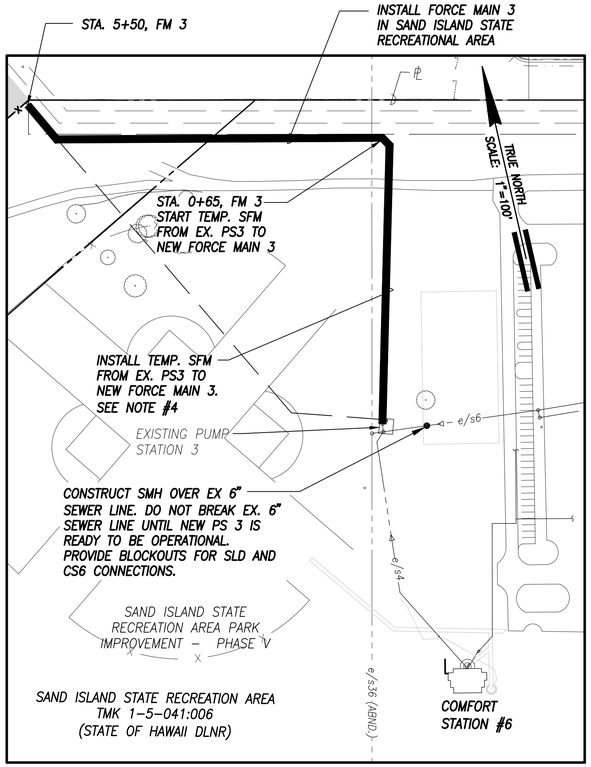
DESIGNED:	AM/JB	SUBMITTED:	
DRAWN:	JB	DATE:	
CHECKED:		SCALE:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO.	C004

JOB NO. F70C616E SHEET NO. 5 OF 30 SHEETS



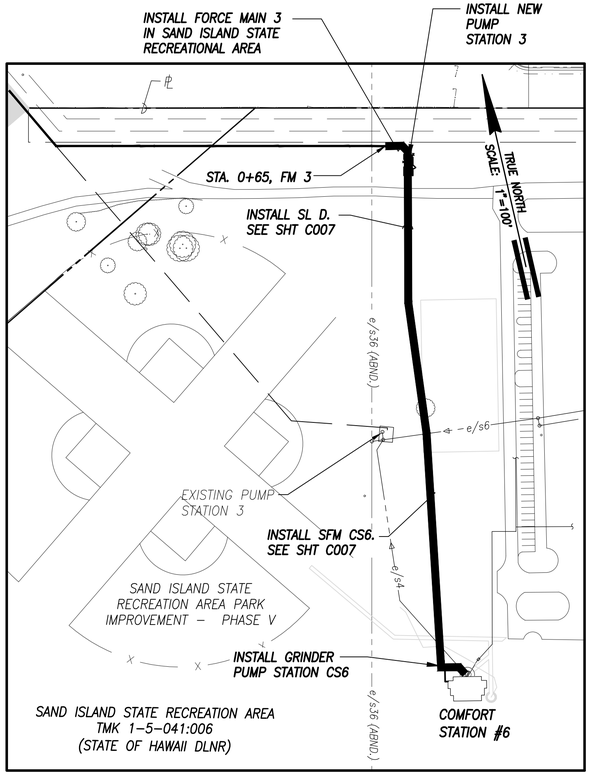
PHASE 1 – FM 3 IN EO AREA

SCALE: 1" = 200'



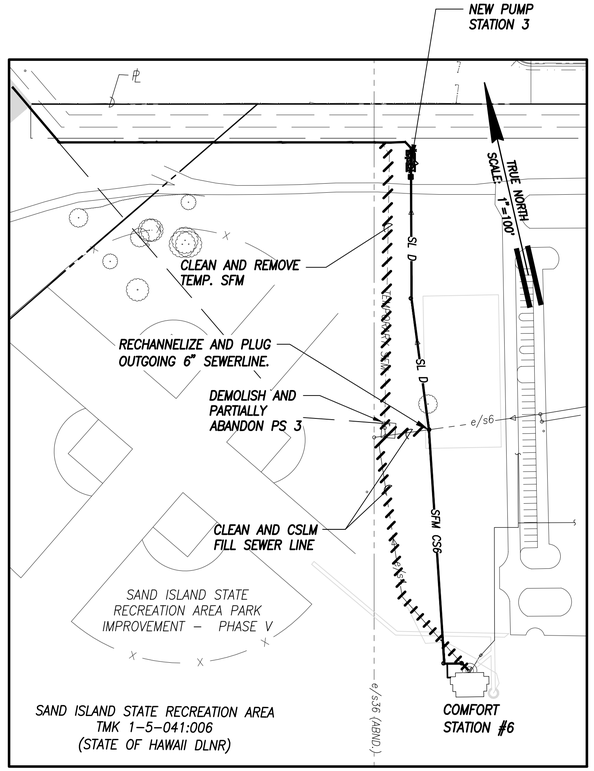
PHASE 2 – FM 3 AND TEMPORARY SFM

SCALE: 1" = 100'



PHASE 3 – SL D AND SFM CS6

SCALE: 1" = 100'



PHASE 4 – DEMO TEMP SFM AND EX PS 3

SCALE: 1" = 100'

LEGEND:

- PROPERTY LINE
- FENCE LINE
- EX FORCE MAIN
- EX SEWER LINE
- EXECUTIVE ORDER AREA (EO-4498)

NOTES:

1) CONTRACTOR MUST COMPLETE INSTALLATION AND TESTING OF PHASE 1 WORK AND BE CLEARED OUT OF THE EO-4498 AREA BY JUNE 7, 2021. NO EXCEPTIONS.

2) CONTRACTOR SHALL COORDINATE WITH FUTURE CITY AND COUNTY OF HONOLULU DEPARTMENT OF ENVIRONMENTAL SERVICES PROJECT (JOB NO. W8-19) IN EO-4498 "SAND ISLAND WWTP MAINTENANCE BUILDING, SEPTAGE, AND SITE IMPROVEMENTS (MBSSI)." CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

3) CONTRACTOR SHALL COORDINATE WORK WITH CONCURRENT DLNR PROJECT "SAND ISLAND STATE RECREATION AREA PARK IMPROVEMENT – PHASE V", JOB NO. F70C616C. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

4) AFTER PHASE 2 IS COMPLETED AND ACCEPTED BY DLNR, THE EXISTING PUMP STATION 3 WILL BECOME OPERATIONAL UTILIZING NEWLY INSTALLED PORTION OF SFM. DLNR WILL BE RESPONSIBLE FOR THE OPERATION OF THE EXISTING PUMP STATION 3.

RECOMMENDED SEWER REHAB PHASING:

PHASE 1 – CONSTRUCT TRANSITION SEWER MANHOLE AND PROPOSED FORCE MAIN 3 WITHIN EO-4498 (STA. 5+50 TO STA. 21+32.83, APPROX 1580 LF)

PHASE 2 – CONSTRUCT FORCE MAIN 3 (STA. 0+65 TO STA. 5+50, APPROX 490 LF) AND CONSTRUCT UNDERGROUND AND ABOVEGROUND TEMPORARY BYPASS PIPING AND INSTALL TEMPORARY SEWER LINE TO EXISTING PUMP STATION 3 (APPROX 390 LF). CONSTRUCT NEW SMH D1 OVER EX. 6" SEWER LINE.

PHASE 3 – CONSTRUCT REMAINING FORCE MAIN 3, PUMP STATION 3, VALVE VAULT, AND PRELOADER 3. CONSTRUCT SEWER LINE D, SMH D2, SFM CS6, GRINDER PUMP STATION CS6, AND CS6 PRELOADER.

PHASE 4 – RECHANNELIZE AND PLUG OUTGOING EX. 6" SEWER LINE AT SMH D1. CLEAN AND REMOVE TEMPORARY FORCEMAIN.

GRAPHIC SCALE:

1" = 100' 100' 50' 0 100' 200'

1" = 200' 200' 100' 0 200' 400'

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANNI Y.M. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 11253-C HAWAII, U.S.A.

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SIGNATURE APRIL 30, 2020 LIC. EXP. DATE

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Planning – Engineering – Environmental Services – Photogrammetry – Surveying – Construction Management
R. M. TOWILL CORPORATION
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494

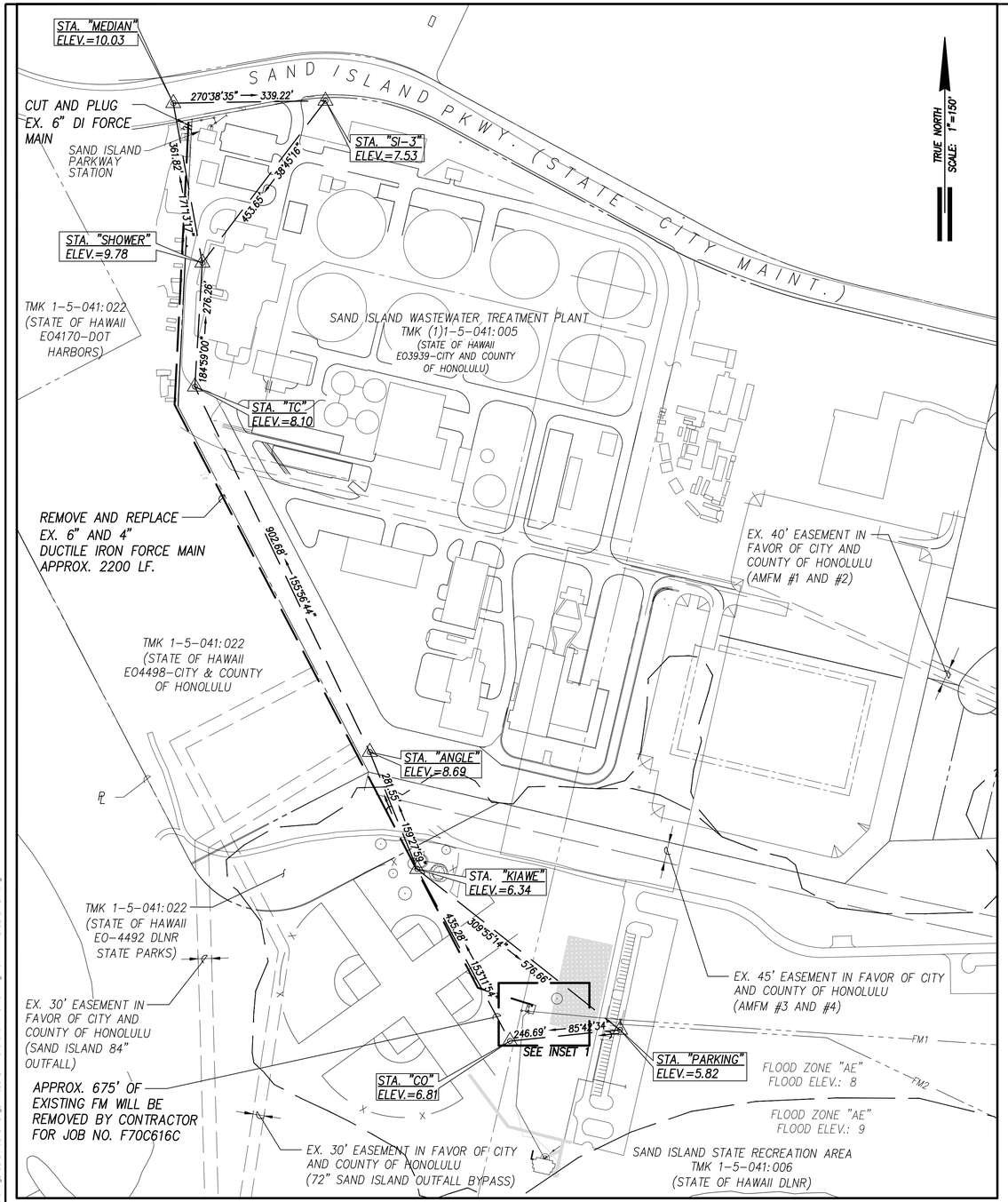
Department of Land and Natural Resources

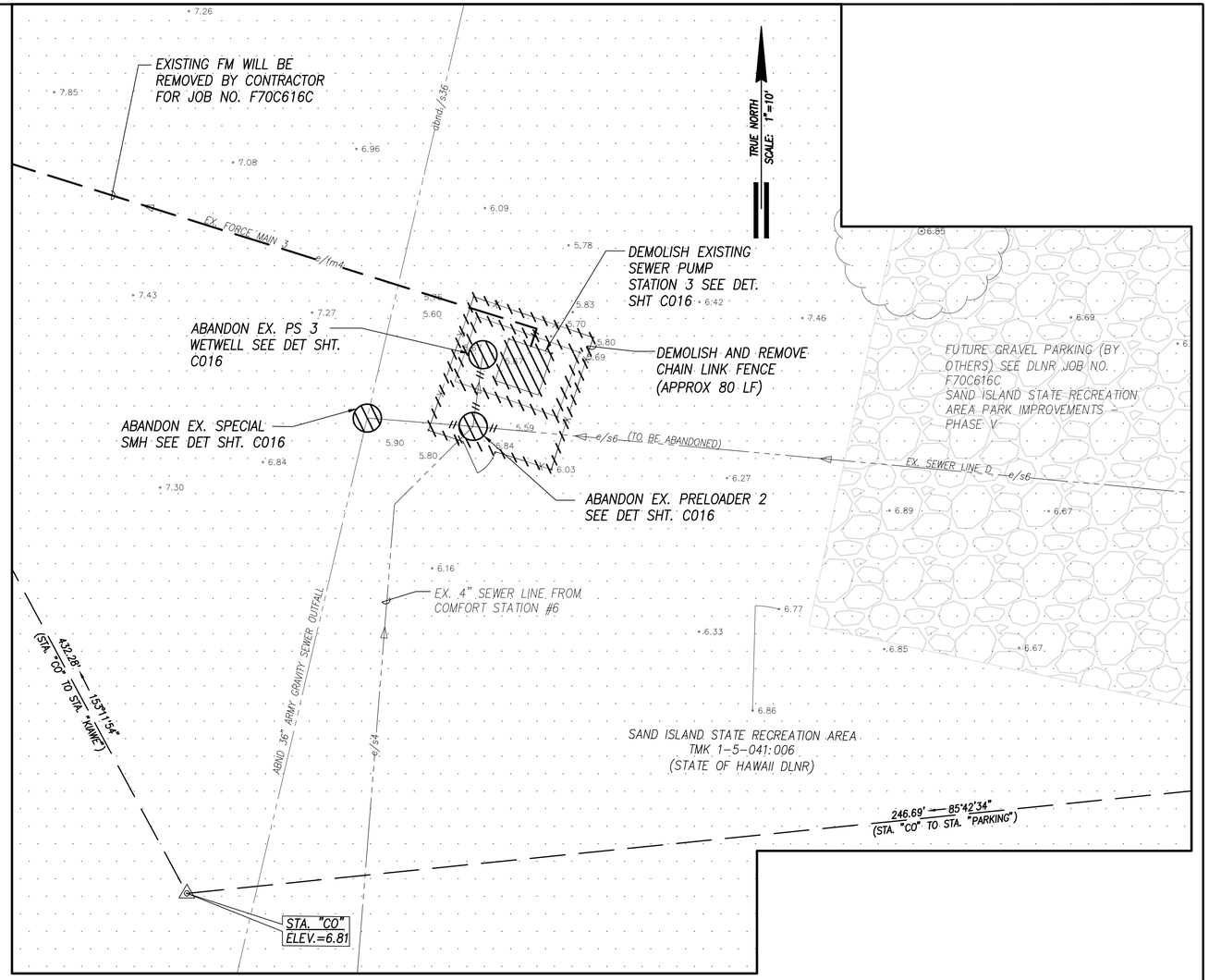
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

PHASING PLAN

DESIGNED:	AM	SUBMITTED:	
DRAWN:	AT	DATE:	
CHECKED:		SCALE:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO.	C005

JOB NO. F70C616E SHEET NO. 6 OF 30 SHEETS





INSET 1

SCALE: 1"=10

LEGEND:

- PROPERTY LINE
- -e/fm4- EX. FORCE MAIN (W/ SIZE & FLOW DIRECTION)
- -e/s6- EX. SEWER LINE (W/ SIZE & FLOW DIRECTION)
- —FM4— PROPOSED FORCE MAIN (W/ SIZE & FLOW DIR.)
- -S6- PROPOSED SEWER LINE (W/ SIZE & FLOW DIR.)
- SPECIAL MANAGEMENT AREA (SMA)

DEMOLITION PLAN

SCALE: 1"=150'

GRAPHIC SCALE:

1" = 10' 10' 5' 0 10' 20'

1" = 150' 150' 75' 0 150' 300'

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO — LICENSED PROFESSIONAL ENGINEER — No. 11253-C — HAWAII, U.S.A.

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Department of Land and Natural Resources

SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

DEMOLITION PLAN

DESIGNED:	AM/JB	SUBMITTED:	
DRAWN:	SF	DATE:	
CHECKED:		SCALE:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO.	C006

JOB NO. F70C616E SHEET NO. 7 OF 30 SHEETS

Thu, 28 Jan 2021 - 2:33pm
K:\w\22948 02 Sand Island Park Sewer Rpg Phase 2\Drawings\Construction Bags\Phase 2 - PS 3 and FM 3 New Alignment\Y PHE DEMO PLAN.dwg

LEGEND:

—— - · ——	PROPERTY LINE
—— —— ——	EXISTING EASEMENT
—◁— — e/fm4—	EX. FORCE MAIN (W/ FLOW DIR. AND SIZE)
—◀— FM4—	PROPOSED FORCE MAIN (W/ DIR. AND SIZE)
—◁- - - e/s6—	EX. GRAVITY SEWER LINE (W/ DIR. AND SIZE)
—◀- - - S8—	PROPOSED GRAVITY SEWER LINE (W/ DIR. & SIZE)
◎ (bold)	NEW SEWER MANHOLE
◎	EX. SEWER MANHOLE
▭	SPECIAL MANAGEMENT AREA (SMA – 1)

TRUE NORTH
SCALE: 1"=30'
45' WIDE SEWER EASEMENT IN FAVOR OF CITY AND COUNTY OF HONOLULU
194°39'15" 11.00'
VALVE VAULT
RELOCATED PUMP STATION 3
149°43'29" 10.00'
194°41'53" 14.00'
PRELOADER 3
SAND ISLAND STATE RECREATION AREA TMK: (1)1-5-041:006
390.95' 168°04'42"
(STA. "PARKING" TO PUMP STATION 3)
SEWER LINE D EXTENSION
FOR PROFILE SEE SHT. C008
1+00
160.25' 194°43'29"
(SMH D2 TO PRELOADER 3)
SMH D2
2+00
175.00' 186°48'19"
(SMH D1 TO SMH D2)
AC PAVEMENT
FUTURE GRAVEL PARKING (BY OTHERS) SEE DLNR JOB NO. F70C616C SAND ISLAND STATE RECREATION AREA PARK IMPROVEMENT PH V
EX SPECIAL SMH A
EX. SPECIAL SMH 1
STA. "PARKING" ELEV.=5.82
FUTURE PARKING STALLS (BY OTHERS) SEE DLNR JOB NO. F70C616C
SL D
SL D, STA. 3+49.27
CUT AND PLUG (TYP.)
SMH D1
246.69' 265°32'34" (STA. "CO" TO STA. "PARKING")
EX PUMP STATION 3
FOR DEMOLITION SEE DET. SHT. C016
116.10' 239°38'49" (STA. "CO" TO SMH D1)
FM 1-1/4
1+00
11°10'42" 309.00'
(SMH D1 TO CS6 PS)
2+00
SEWER FORCE MAIN CS6
FOR PROFILE SEE SHT C009
PRELOADER CS6
3+00
CS6 GRINDER PS
COMFORT STATION #6
SAND ISLAND STATE RECREATION AREA ℄
SAND ISLAND WASTEWATER TREATMENT PLANT TMK (1)1-5-041:005 (STATE OF HAWAII E03939-CITY AND COUNTY OF HONOLULU)
(ABANDONED 36" ARMY GRAVITY SEWER OUTFALL)
FORCE MAIN 3
SEE PLAN AND PROFILE SHTS. C010 TO C014
DIRT ROAD
365.00' 104°43'29"
SAND ISLAND STATE RECREATION AREA TMK: (1)1-5-041:006
576.66' 129°55'14" (STA. "PARKING" TO STA. "KIAWE")
EXISTING PUMP STATION 3 WETWELL
EXISTING FORCE MAIN 3
TO BE ABND.
STA. "CO" ELEV.=6.81
EX. 4" FROM COMFORT STATION 6
SAND ISLAND STATE RECREATION AREA ℄
435.28' 153°11'54"
(STA. "CO" TO STA. "KIAWE")
STA. "KIAWE" ELEV.=6.34
104°43'29" 18.60'
74.31' 104°43'29"
5+00
4+00
3+00
TMK 1-5-041:022 (STATE OF HAWAII EO-4492 DLNR STATE PARKS)
FUTURE SOFTBALL FIELDS AND IRRIG. PIPING (BY OTHERS) SEE DLNR JOB NO. F70C616C

NOTES:

1) CONTRACTOR SHALL COORDINATE WORK WITH FUTURE DLNR PROJECT "SAND ISLAND STATE RECREATION AREA PARK IMPROVEMENT – PHASE V", JOB NO. F70C616C. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

2) CONTRACTOR TO PROVIDE CONTINUOUS SEWER SERVICE TO ALL COMFORT STATIONS.

3) CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS BACK TO ORIGINAL CONDITION OR BETTER.

PUMP STATION 3 & GRAVITY SEWER LOCATION PLAN

SCALE: 1"=30'

GRAPHIC SCALE:
1" = 30' — 30' 15' 0 30' 60'

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO — LICENSED PROFESSIONAL ENGINEER — No. 11253-C — HAWAII, U.S.A.

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SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

"OBSERVATION OF CONSTRUCTION" IS DEFINED IN CHAPTER 16–115, HAWAII ADMINISTRATIVE RULES ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

Planning – Engineering – Environmental Services – Photogrammetry – Surveying – Construction Management
R. M. TOWILL CORPORATION
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494

Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

PUMP STATION 3 & GRAVITY SEWER PLAN

DESIGNED:	AM/JB	SUBMITTED:	
DRAWN:	SF	DATE:	
CHECKED:		SCALE:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO.	C007

JOB NO. F70C616E SHEET NO. 8 OF 30 SHEETS

SAND ISLAND WASTEWATER TREATMENT PLANT
TMK (1)1-5-041:005
(STATE OF HAWAII EO3939-CITY AND COUNTY OF HONOLULU)

45' WIDE SEWER EASEMENT IN FAVOR OF CITY AND COUNTY OF HONOLULU

PUMP STATION 3 WETWELL
STA. 0+00, SL D
SEE SHT. C019 FOR DET.
TOP=8.00±
INV. (OUT)=2.71
INV. (IN)=-2.56
SUMP=-8.15

VALVE VAULT SEE PLAN AND PROFILE SHT C010

PRELOADER 3
STA. 0+14, SL D
SEE SHT. C019 FOR DET.
TOP=8.22±
INV. (IN)=-2.79
INV. (OUT)=-2.56
SUMP=-6.06

SAND ISLAND STATE RECREATION AREA
TMK: (1)1-5-041:006

FUTURE PARKING STALLS (BY OTHERS)
SEE DLNR JOB NO. F70C616C

AC PAVEMENT

EX. SPECIAL SMH 1
INV.=2.5 (EX. S6)
=2.2 (EX FM 4)
=2.0 (EX. FM 4)
(PER AS-BUILT DWG)

EX SPECIAL SMH A
INV.=2.0 (EX FM 4)
(PER AS-BUILT DWG)

TRUE NORTH
SCALE: 1"=20'

FUTURE GRAVEL PARKING (BY OTHERS)
SEE DLNR JOB NO. F70C616C
SAND ISLAND STATE RECREATION AREA
PARK IMPROVEMENT - PH V

EX/SPCL SMH 1 TO EX PS3 PRELOADER SMH
206.31' — 96°48'19"

EX/SPCL SMH 1 TO SMH D1
148.35' — 96.48'19"

(STA. "CO" TO STA. "PARKING")
85°42'34" — 246.69'

CONSTRUCTION CONSTRUCTION PHASE 3
CONSTRUCTION PHASE 2

AMFM3
AMFM4
e/fm60
e/fm60

DIRT ROAD

fuf/irr3

S8

160.25' — 194°43'29"
(SMH D2 TO PRELOADER 3)

175.00' — 186°48'19"
(SMH D1 TO SMH D2)

0+00
1+00

SMH D2
STA. 1+74.27, SL D
TOP=6.91±
INV.=-0.31
CONTRACTOR TO VERIFY GROUND ELEVATION

SMH D1
STA. 3+49.27, SL D
=STA. 0+00, SL CS-6
TOP=6.43±
INV.=1.44
CONTRACTOR TO VERIFY INVERT

CUT AND PLUG (TYP.)

SEWER LINE CS6
FOR PROFILE SEE SHT C009

FORCE MAIN 3
SEE PLAN AND PROFILE SHTS. C010 TO C014

FM4

e/s36 (ABND.)

(ABANDONED 36" ARMY GRAVITY SEWER OUTFALL)

FUTURE IRRIG. LINE. (BY OTHERS)
SEE DLNR JOB NO. F70C616C

e/s6 (TO BE ABND.)

PLAN: SEWER LINE D

SCALE: 1" = 20'

EXIST. GROUND ALONG SEWER LINE ℄

MIN. 3' COVER, TYP.

160.25 LF 8" PVC @ S=1.25%

175.0 LF 8" PVC @ S=1.00%

PRELOADER 3
0+14
-2.31 S8 (IN)
-2.56 S6 (OUT)
-6.06 SUMP

START CONSTRUCTION PUMP STATION 3 WETWELL
0+00
S6 (IN) -2.56
S3 (OUT) -2.71
SUMP -8.15

SMH D2
1+74.27
-0.31 S8

SMH D1
3+88.23
1.44 S1-1/4 (IN)
1.44 S8 (OUT)
1.44 e/s6 (IN)

PROPOSED S8
Qa = 0.881 mgd
Qr = 0.144 mgd
Va = 3.87 fps
Vr = 2.93 fps
n = 0.013
s = 0.0125 ft/ft

PROPOSED S8
Qa = 0.789 mgd
Qr = 0.144 mgd
Va = 3.46 fps
Vr = 2.65 fps
n = 0.013
s = 0.01 ft/ft

PROFILE: SEWER LINE D

SCALE: HOR: 1" = 20'
VERT: 1" = 4'

GRAPHIC SCALES:

HOR: 1"=20' 1" = 20' 20' 10' 0 20' 40'

VERT: 1"=4' 1" = 4' 4' 2' 0 4' 8'

0 -10 -20

0+00 1+00 2+00 3+00 4+00 5+00 6+00

NOTES:

1) CONTRACTOR SHALL COORINDATE WORK WITH FUTURE DLNR PROJECT "SAND ISLAND STATE RECREATION AREA PARK IMPROVEMENT - PHASE V", JOB NO. F70C616C. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

2) CONTRACTOR TO PROVIDE CONTINUOUS SEWER SERVICE TO ALL COMFORT STATIONS.

3) CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS BACK TO ORIGINAL CONDITION OR BETTER.

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 11253-C
HAWAII, U.S.A.

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R. M. TOWILL CORPORATION
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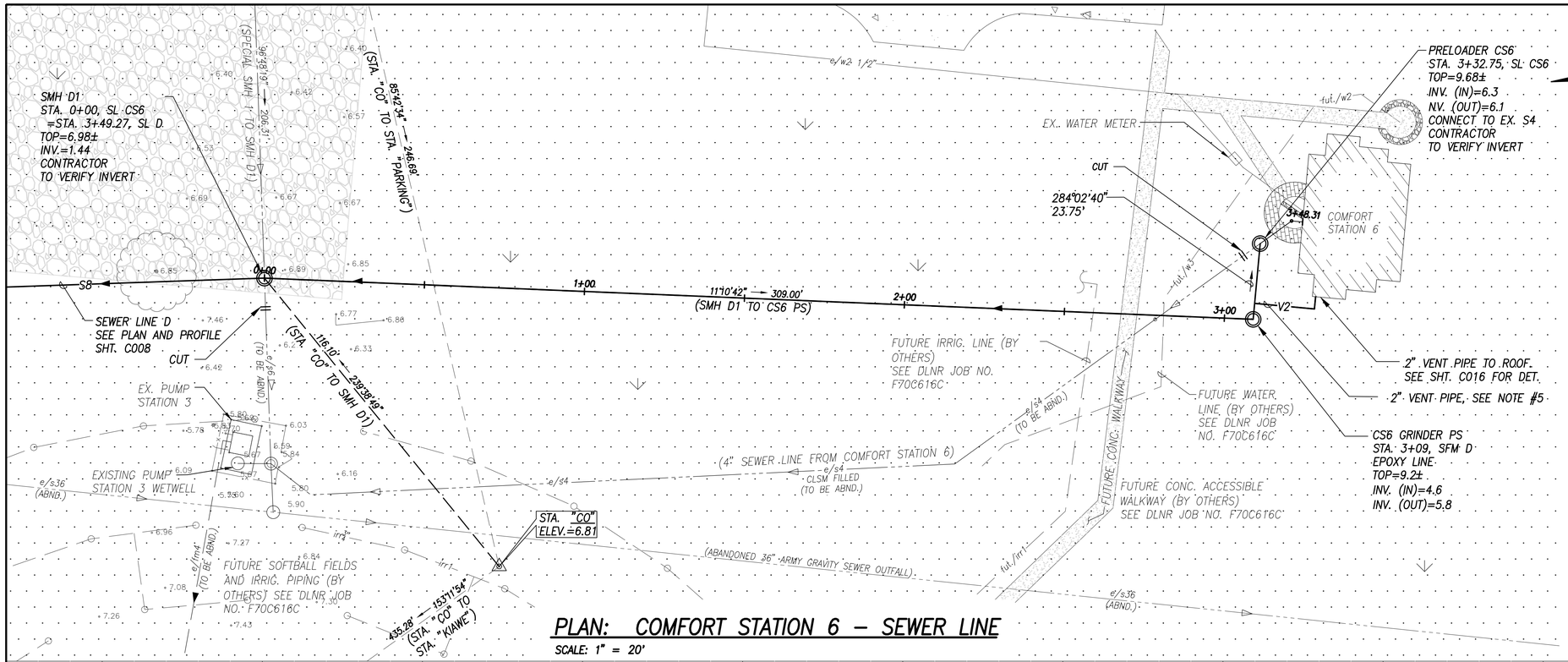
Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

SEWER LINE D
PLAN AND PROFILE

DESIGNED:	AM/JB/AT	SUBMITTED:	
DRAWN:	JB/AT/SF	DATE:	
CHECKED:	AM	SCALE:	H: 1"=20', V: 1"=4'
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO.	C008

JOB NO. F70C616E SHEET NO. 9 OF 30 SHEETS

Fri, 29 Jan 2021 - 4:53pm
K:\w\02948 02 Sand Island Park Sewer Sys\ Phase 2\Drawings\Construction Dwgs\Phase 2 - PS 3 and FM 3 New Alignment\S SEWER LINE D PLAN AND PROFILE_revised.dwg



PLAN: COMFORT STATION 6 – SEWER LINE

SCALE: 1" = 20'

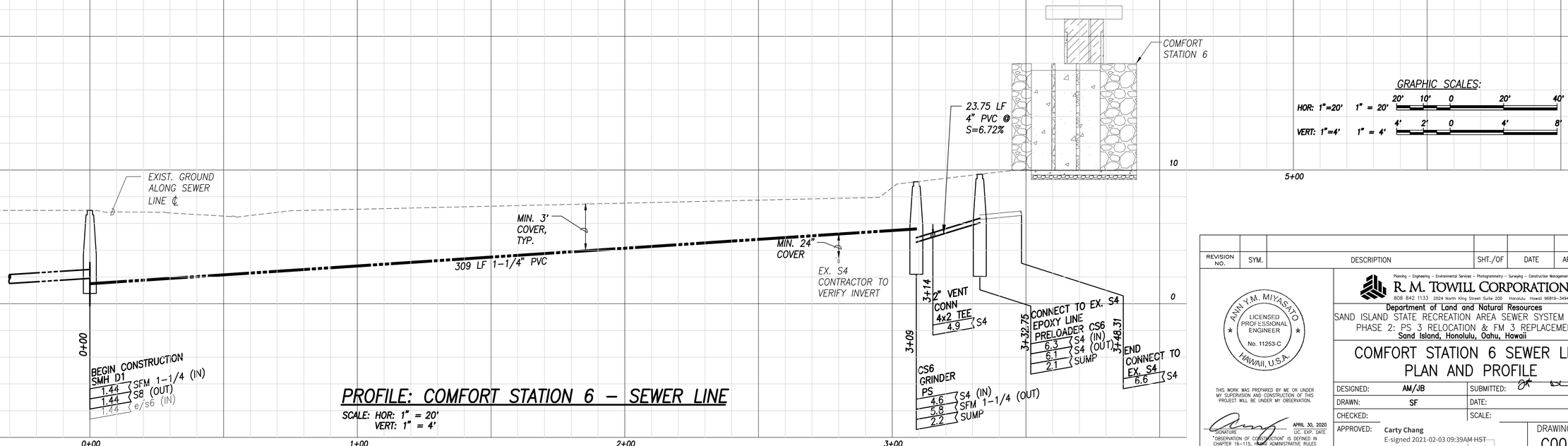
TRUE NORTH
SCALE: 1"=20'

LEGEND:

- PROPERTY LINE
- EXISTING EASEMENT
- e/fm4 — EX. FORCE MAIN (W/ FLOW DIR. AND SIZE)
- FM4 — PROPOSED FORCE MAIN (W/ DIR. AND SIZE)
- e/s6 — EX. GRAVITY SEWER LINE (W/ DIR. AND SIZE)
- S6 — PROPOSED GRAVITY SEWER LINE (W/ DIR. & SIZE)
- NEW SEWER MANHOLE
- EX. SEWER MANHOLE
- SPECIAL MANAGEMENT AREA (SMA – 1)

NOTES:

1) CONTRACTOR SHALL COORINDATE WORK WITH FUTURE DLNR PROJECT "SAND ISLAND STATE RECREATION AREA PARK IMPROVEMENT – PHASE V", JOB NO. F70C616C. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
2) CONTRACTOR TO PROVIDE CONTINUOUS SEWER SERVICE TO ALL COMFORT STATIONS.
3) CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS BACK TO ORIGINAL CONDITION OR BETTER.
4) PLAIN CONCRETE JACKET REQUIRED FOR SEWER LINES WITH LESS THAN 3' COVER. FOR DETAIL SEE SHT C015.
5) INSTALL SPECIAL WARNING SIGN OVER EACH TOILET AND URINAL IN COMFORT STATION 1. SEE DETAIL ON SHT.



PROFILE: COMFORT STATION 6 – SEWER LINE

SCALE: HOR: 1" = 20'
VERT: 1" = 4'

GRAPHIC SCALES:

HOR: 1"=20' 1" = 20' — 20' 10' 0 20' 40'
VERT: 1"=4' 1" = 4' — 4' 2' 0 4' 8'

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

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R. M. TOWILL CORPORATION
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494

Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

COMFORT STATION 6 SEWER LINE
PLAN AND PROFILE

ANN Y.M. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 11253-C
HAWAII, U.S.A.

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SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

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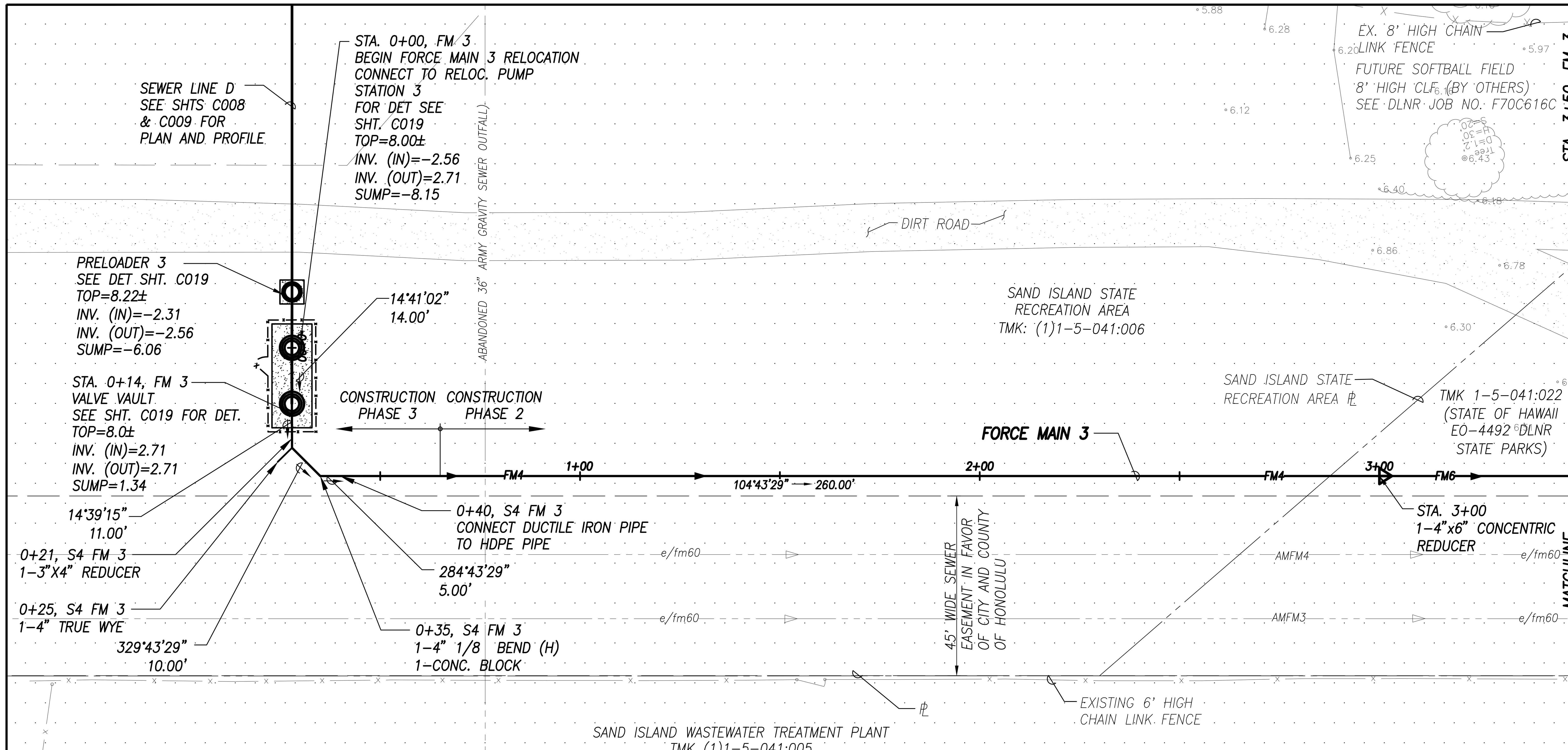
DESIGNED:	AM/JB
DRAWN:	SF
CHECKED:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer
SUBMITTED:	
DATE:	
SCALE:	

DRAWING NO. C009

JOB NO. F70C616E SHEET NO. 10 OF 30 SHEETS

Mon, 01 Feb 2021 - 8:35am
X:\work\20948 02 Sand Island Plans Sewer Dsg Phase 2 - PS 3 and FM 3 New Alignment\10 CS 6 Sewer Line.dwg



PLAN: FORCE MAIN 3 – 1

SCALE: 1" = 20'

NOTE:

1) CONTRACTOR TO PROVIDE CONTINUOUS SEWER SERVICE.

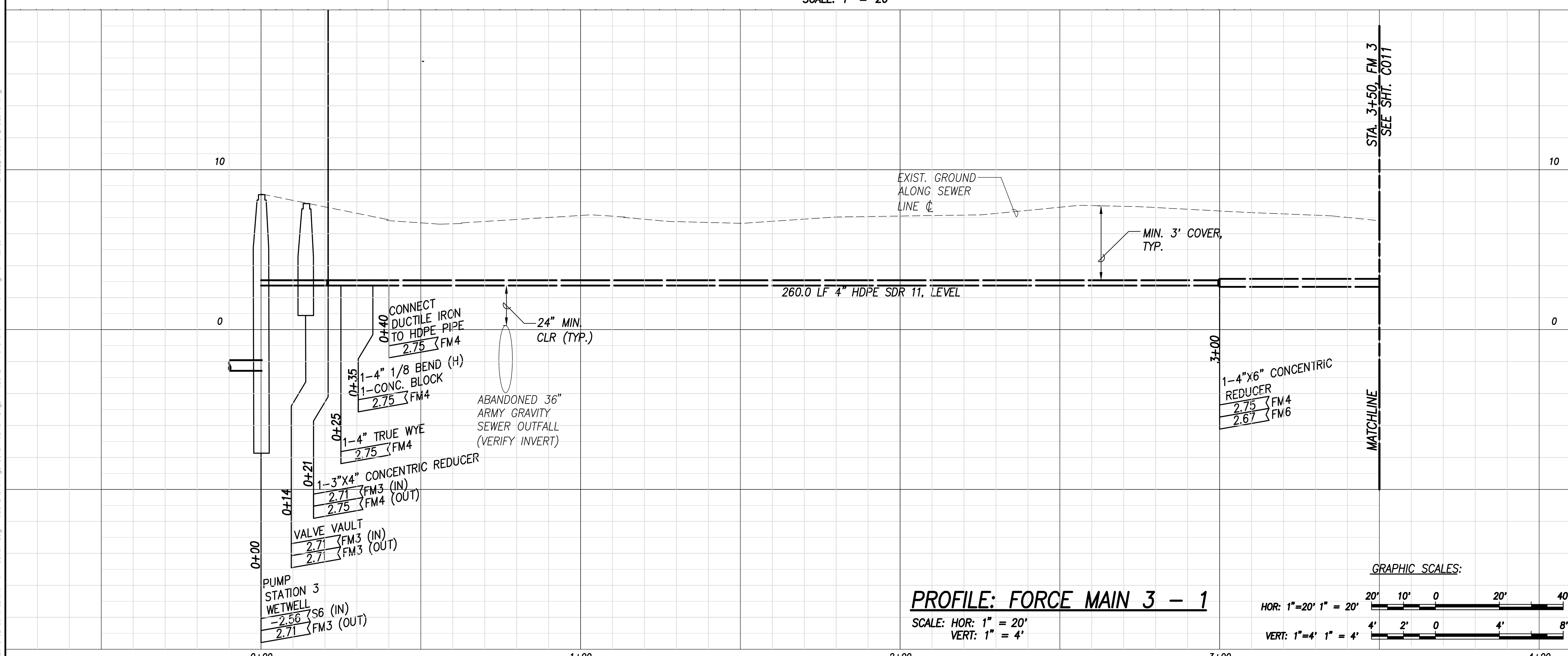
2) CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS BACK TO ORIGINAL CONDITION OR BETTER.

3) FOR LIMITS OF DISTURBED AREA SEE SHT. C004.

4) IF THE NEW FORCE MAIN ALIGNMENT DEVIATES FROM THE EXISTING FORCE MAIN ALIGNMENT, THE CONTRACTOR SHALL CLSM FILL AND ABANDON IN PLACE.

LEGEND :

— - —	PROPERTY LINE
— — —	EXISTING EASEMENT
e/fm4	EX. SEWER LINE (W/ TYPE, DIR., AND SIZE)
FM4	PROPOSED SEWER LINE (W/ TYPE, DIR. AND SIZE)
◎	NEW SEWER MANHOLE
◎	EX. SEWER MANHOLE
▭	SPECIAL MANAGEMENT AREA (SMA)



PROFILE: FORCE MAIN 3 – 1

SCALE: HOR: 1" = 20'
VERT: 1" = 4'

GRAPHIC SCALES:

HOR: 1"=20' 1" = 20' — 20' 10' 0 20' 40'

VERT: 1"=4' 1" = 4' — 4' 2' 0 4' 8'

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO — LICENSED PROFESSIONAL ENGINEER — No. 11253-C — HAWAII, U.S.A.

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Department of Land and Natural Resources

SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV

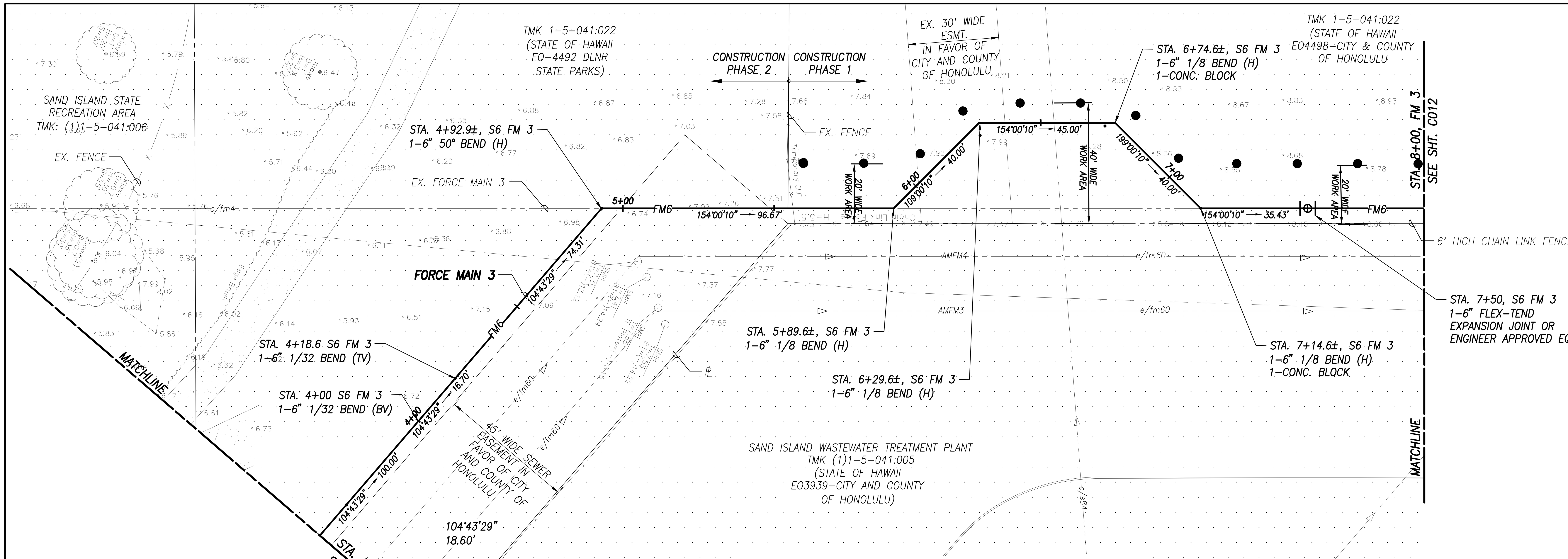
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT

Sand Island, Honolulu, Oahu, Hawaii

FORCE MAIN 3
PLAN AND PROFILE – 1

DESIGNED:	AT	SUBMITTED:	
DRAWN:	SF	DATE:	
CHECKED:	AM	SCALE:	
APPROVED:	Carty Chang, E-signed 2021-02-03 09:39AM HST, carty.s.chang@hawaii.gov, State of Hawaii, Chief Engineer	DRAWING NO.	C010

JOB NO. F70C616E SHEET NO. 11 OF 30 SHEETS



PLAN: FORCE MAIN 3 – 2

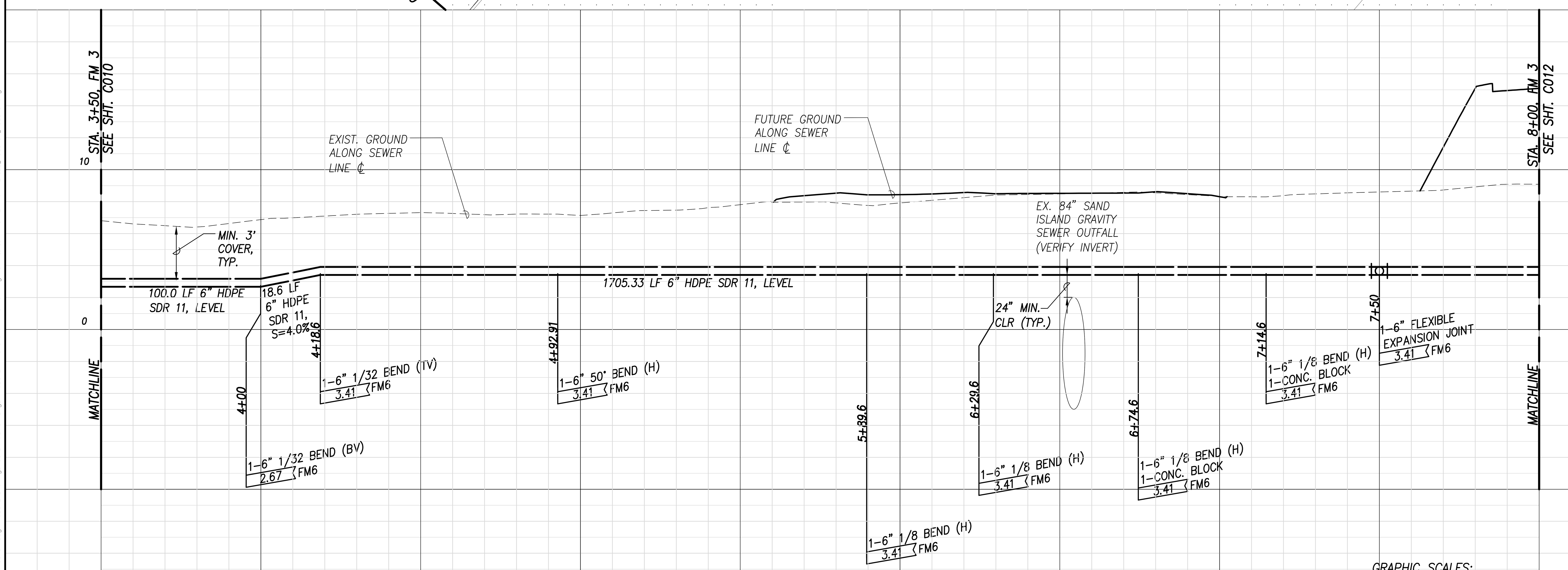
SCALE: 1" = 20'

NOTE:

1) CONTRACTOR TO PROVIDE CONTINUOUS SEWER SERVICE.
2) CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS BACK TO ORIGINAL CONDITION OR BETTER.
3) FOR LIMITS OF DISTURBED AREA SEE SHT. C004.
4) IF THE NEW FORCE MAIN ALIGNMENT DEVIATES FROM THE EXISTING FORCE MAIN ALIGNMENT, THE CONTRACTOR SHALL CLSM FILL AND ABANDON IN PLACE.

LEGEND:

- PROPERTY LINE
- EXISTING EASEMENT
- e/fm4 EX. SEWER LINE (W/ TYPE, DIR., AND SIZE)
- FM4 PROPOSED SEWER LINE (W/ TYPE, DIR. AND SIZE)
- NEW SEWER MANHOLE
- EX. SEWER MANHOLE
- SPECIAL MANAGEMENT AREA (SMA)
- EXPANSION JOINT
- CONES OR BARRIER FOR WORK AREA



PROFILE: FORCE MAIN 3 – 2

SCALE: HOR: 1" = 20'
VERT: 1" = 4'

GRAPHIC SCALES:
HOR: 1"=20' 1" = 20' (20' 10' 0 20' 40')
VERT: 1"=4' 1" = 4' (4' 2' 0 4' 8')

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO — LICENSED PROFESSIONAL ENGINEER — No. 11253-C — HAWAII, U.S.A.

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R. M. TOWILL CORPORATION
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494

Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

FORCE MAIN 3 PLAN AND PROFILE – 2

DESIGNED: AM/JB	SUBMITTED:
DRAWN: SF	DATE:
CHECKED:	SCALE:
APPROVED: Carty Chang, E-signed 2021-02-03 09:39AM HST, carty.s.chang@hawaii.gov, State of Hawaii, Chief Engineer	DRAWING NO. C011

JOB NO. F70C616E SHEET NO. 12 OF 30 SHEETS

TMK 1-5-041:022
(STATE OF HAWAII
E04498-CITY & COUNTY
OF HONOLULU

STA. 8+00, FM 3
SEE SHT. C011

STA. 13+00, FM 3
SEE SHT. C013

(72" SAND ISLAND BYPASS SEWER OUTFALL)

TRUE NORTH
SCALE: 1"=20'

STA. 10+20, S6 FM 3
1-6" FLEX-TEND
EXPANSION JOINT OR
ENGINEER APPROVED EQUAL

STA. 12+50, S6 FM 3
1-6" FLEX-TEND
EXPANSION JOINT OR
ENGINEER APPROVED EQUAL

20' WIDE WORK AREA

9+00
10+00
11+00
12+00
13+00

154°00'12" — 270.00'
154°00'10" — 230.00'

FM6
FORCE MAIN 3

6' HIGH CHAIN LINK FENCE

AMFM4
AMFM3
e/fm60

MATCHLINE
MATCHLINE

NOTE:

1) CONTRACTOR TO PROVIDE CONTINUOUS SEWER SERVICE.
2) CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS BACK TO ORIGINAL CONDITION OR BETTER.
3) FOR LIMITS OF DISTURBED AREA SEE SHT. C004.
4) IF THE NEW FORCE MAIN ALIGNMENT DEVIATES FROM THE EXISTING FORCE MAIN ALIGNMENT, THE CONTRACTOR SHALL CLSM FILL AND ABANDON IN PLACE.

LEGEND:

- PROPERTY LINE
- EXISTING EASEMENT
- e/fm4 — EX. SEWER LINE (W/ TYPE, DIR., AND SIZE)
- FM4 — PROPOSED SEWER LINE (W/ TYPE, DIR. AND SIZE)
- NEW SEWER MANHOLE
- EX. SEWER MANHOLE
- SPECIAL MANAGEMENT AREA (SMA)
- EXPANSION JOINT
- CONE OR BARRIER FOR WORK AREA

PLAN: FORCE MAIN 3 – 3

SCALE: 1" = 20'

PROFILE: FORCE MAIN 3 – 3

SCALE: HOR: 1" = 20'
VERT: 1" = 4'

STA. 8+00, FM 3
SEE SHT. C011

STA. 13+00, FM 3
SEE SHT. C013

EXIST. GROUND
ALONG SEWER
LINE ℄

FUTURE GROUND
ALONG SEWER
LINE ℄

MIN. 3'
COVER,
TYP.

1705.33 LF 6" HDPE SDR 11, LEVEL

24" MIN.
CLR (TYP.)

EX. 72"
SAND ISLAND
WASTEWATER TREATMENT
PLANT BYPASS SEWER
OUTFALL
(VERIFY INVERT)

10+20
1-6" FLEXIBLE
EXPANSION JOINT
3.41 FM6

12+50
1-6" FLEXIBLE
EXPANSION JOINT
3.41 FM6

MATCHLINE
MATCHLINE

8+00
9+00
10+00
11+00
12+00

GRAPHIC SCALES:

HOR: 1"=20' 1" = 20' 20' 10' 0 20' 40'
VERT: 1"=4' 1" = 4' 4' 2' 0 4' 8'

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 11253-C
HAWAII, U.S.A.

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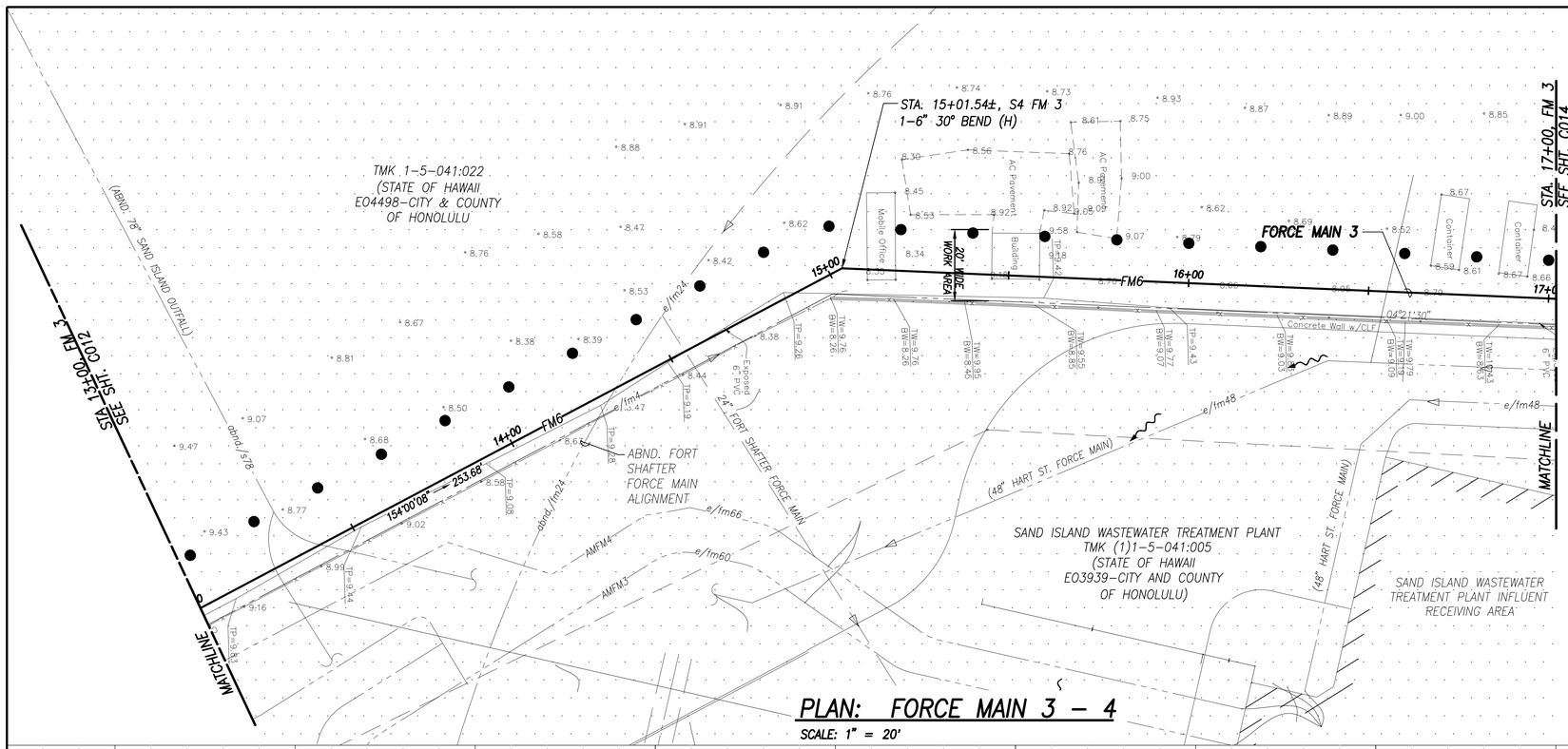
Planning – Engineering – Environmental Services – Photogrammetry – Surveying – Construction Management
R. M. TOWILL CORPORATION
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494

Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

FORCE MAIN 3
PLAN AND PROFILE – 3

DESIGNED:	AM/JB	SUBMITTED:	
DRAWN:	SF	DATE:	
CHECKED:		SCALE:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO.	C012

JOB NO. F70C616E



PLAN: FORCE MAIN 3 – 4

SCALE: 1" = 20'

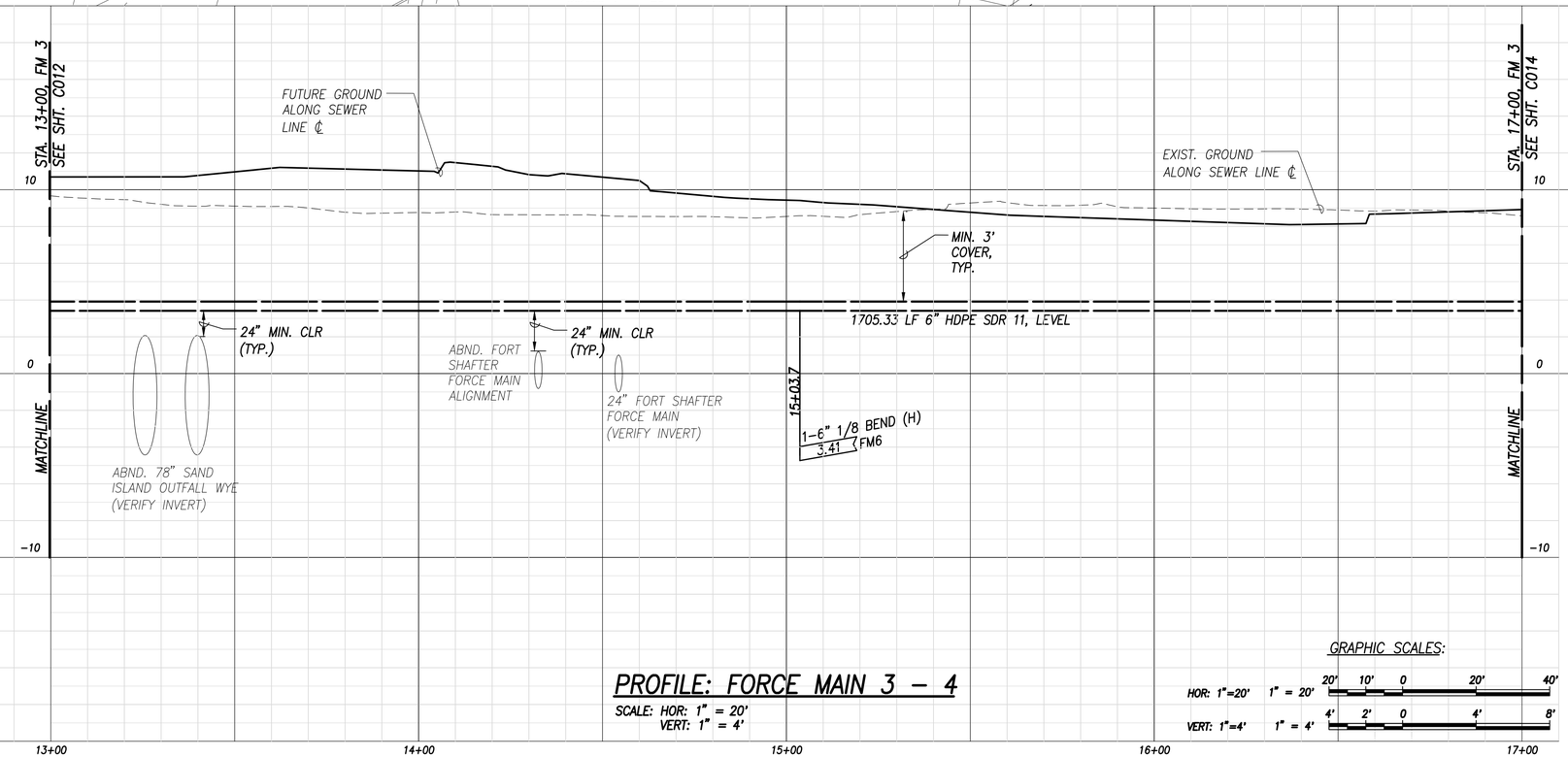
TRUE NORTH
SCALE: 1"=20'

NOTE:

1) CONTRACTOR TO PROVIDE CONTINUOUS SEWER SERVICE.
2) CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS BACK TO ORIGINAL CONDITION OR BETTER.
3) FOR LIMITS OF DISTURBED AREA SEE SHT. C004.
4) CONTRACTOR TO VERIFY IF ANY CONTAINERS, BUILDINGS, ETC. WITH IN NEW FM ALIGNMENT NEEDS TO BE RELOCATED AND/OR DEMOLISHED. ALL COST INCIDENTAL TO PROJECT.
4) IF THE NEW FORCE MAIN ALIGNMENT DEVIATES FROM THE EXISTING FORCE MAIN ALIGNMENT, THE CONTRACTOR SHALL CLSM FILL AND ABANDON IN PLACE.

LEGEND:

- PROPERTY LINE
- EXISTING EASEMENT
- e/fm4 EX. SEWER LINE (W/ TYPE, DIR., AND SIZE)
- FM4 PROPOSED SEWER LINE (W/ TYPE, DIR. AND SIZE)
- NEW SEWER MANHOLE
- EX. SEWER MANHOLE
- SPECIAL MANAGEMENT AREA (SMA)
- CONE OR BARRIER FOR WORK AREA



PROFILE: FORCE MAIN 3 – 4

SCALE: HOR: 1" = 20'
VERT: 1" = 4'

GRAPHIC SCALES:

HOR: 1"=20' 1" = 20' 20' 10' 0 20' 40'
VERT: 1"=4' 1" = 4' 4' 2' 0 4' 8'

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 11253-C
HAWAII, U.S.A.

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Planning – Engineering – Environmental Services – Photogrammetry – Surveying – Construction Management
R. M. TOWILL CORPORATION
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494

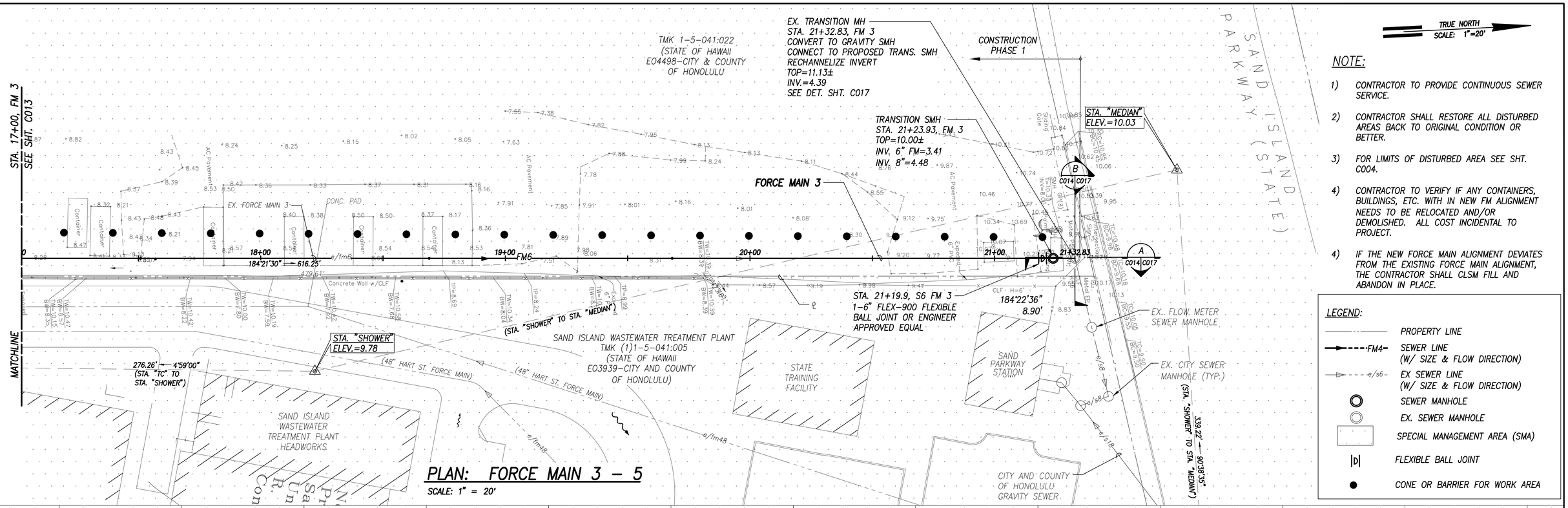
Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

FORCE MAIN 3
PLAN AND PROFILE – 4

DESIGNED:	AM/JB	SUBMITTED:	
DRAWN:	SF	DATE:	
CHECKED:		SCALE:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO.	C013

JOB NO. F70C616E SHEET NO. 14 OF 30 SHEETS

Fri, 29 Jan 2021 - 11:11an
K:\w\02948 02 Sand Island Park Sewer Imp Phase 2\Drawings\Construction Dwgs\Phase 2 - PS 3 and FM 3 New Alignment\11-15 FM 3 PLAN & PROFILE_recover_recover.dwg

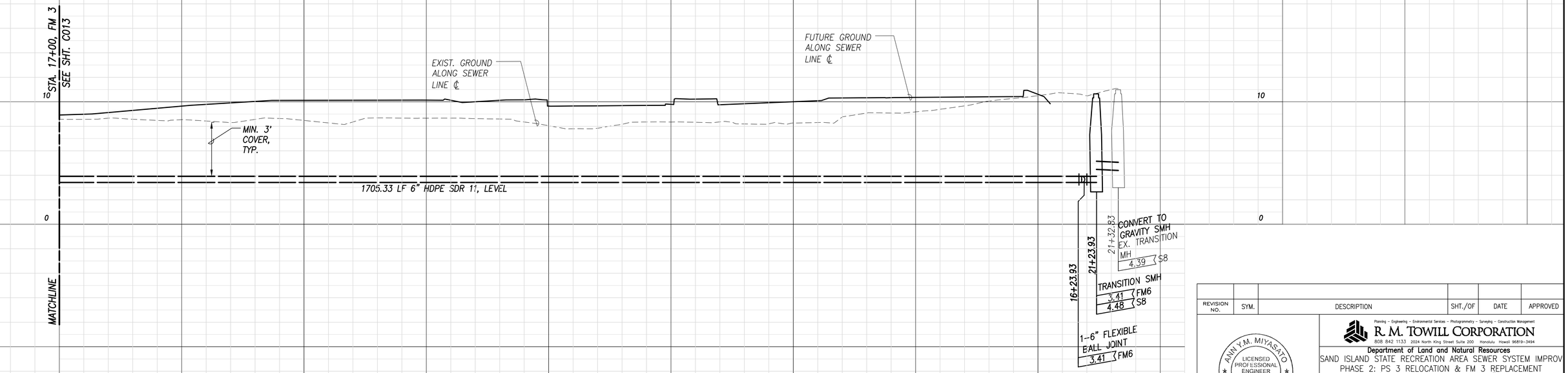


NOTE:

1) CONTRACTOR TO PROVIDE CONTINUOUS SEWER SERVICE.
2) CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS BACK TO ORIGINAL CONDITION OR BETTER.
3) FOR LIMITS OF DISTURBED AREA SEE SHT. C004.
4) CONTRACTOR TO VERIFY IF ANY CONTAINERS, BUILDINGS, ETC. WITH IN NEW FM ALIGNMENT NEEDS TO BE RELOCATED AND/OR DEMOLISHED. ALL COST INCIDENTAL TO PROJECT.
4) IF THE NEW FORCE MAIN ALIGNMENT DEVIATES FROM THE EXISTING FORCE MAIN ALIGNMENT, THE CONTRACTOR SHALL CLSM FILL AND ABANDON IN PLACE.

LEGEND:

- PROPERTY LINE
- FM4 — SEWER LINE (W/ SIZE & FLOW DIRECTION)
- e/s6 — EX SEWER LINE (W/ SIZE & FLOW DIRECTION)
- SEWER MANHOLE
- EX. SEWER MANHOLE
- SPECIAL MANAGEMENT AREA (SMA)
- |D| FLEXIBLE BALL JOINT
- CONE OR BARRIER FOR WORK AREA



PROFILE: FORCE MAIN 3 – 4

SCALE: HOR: 1" = 20'
VERT: 1" = 4'

GRAPHIC SCALES:

HOR: 1"=20' 1" = 20' 20' 10' 0 20' 40'
VERT: 1"=4' 1" = 4' 4' 2' 0 4' 8'

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 11253-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

"OBSERVATION OF CONSTRUCTION" IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

Planning – Engineering – Environmental Services – Photogrammetry – Surveying – Construction Management
R. M. TOWILL CORPORATION
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494

Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

FORCE MAIN 3
PLAN AND PROFILE – 5

DESIGNED:	AM/JB	SUBMITTED:	
DRAWN:	SF	DATE:	
CHECKED:		SCALE:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Civil Engineer	DRAWING NO.	C014

JOB NO. F70C616E SHEET NO. 15 OF 30 SHEETS

Fri, 29 Jan 2021 - 11:15am
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BMP NOTES:

TEMPORARY EROSION CONTROL MEASURES:

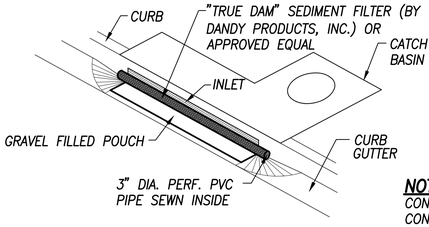
1. PRIOR TO GROUND DISTUBANCE, TEMPORARY EROSION CONTROL MEASURES, SUCH AS COMPOST FILTER SOCK SHALL BE INSTALLED.
2. OPENING AND CLEARING OF LAND SHALL BE PERFORMED INCREMENTALLY TO MINIMIZE EROSION POTENTIAL.
3. WHEN CLEARED OR GRUBBED AREAS ARE NOT TO BE GRADED OR DISTURBED FOR 30 DAYS OR MORE, SEED, PLANT, OR HYDROSEED TEMPORARY VEGETATION, UNLESS REMAINING NATURAL VEGETATION PROVIDES ADEQUATE PROTECTION.
4. BIOSOCK COMPOST FILTER SOCK SHALL BE USED AT LOCATIONS SPECIFIED ON PLANS OR DESIGNATED BY THE CONSTRUCTION MANAGER.
5. SILT WHICH HAS ACCUMULATED ALONG THE FILTER SOCK SHALL BE REMOVED AND DISPOSED OF ON A BI-WEEKLY BASIS.
6. ALL SLOPES AND EXPOSED AREAS SHALL BE SODDED OR PLANTED AS SOON AS FINAL GRADES HAVE BEEN ESTABLISHED. PLANTING SHALL NOT BE DELAYED UNTIL ALL GROUND DISTURBING WORK HAS BEEN COMPLETED. GRADING TO FINAL GRADE SHALL BE CONTINUOUS, AND ANY AREA WITHIN WHICH WORK HAS BEEN INTERRUPTED OR DELAYED SHALL BE PLANTED.
7. TEMPORARY EROSION CONTROLS SHALL NOT BE REMOVED BEFORE PERMANENT EROSION CONTROLS ARE IN-PLACE AND ESTABLISHED.

NOTES FOR ENVIRONMENTAL PROTECTION

1. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL PROVIDE EFFECTIVE MEASURES FOR THE CONTROL OF FUGITIVE DUST EMISSIONS FROM THE PROJECT AND SURROUNDING AREAS CAUSED BY HIS OPERATIONS. THESE MEASURES SHALL MEET THE REQUIREMENTS OF STATE ADMINISTRATIVE RULES, DEPARTMENT OF HEALTH, AIR POLLUTION CONTROL (11-60.1)
2. ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE GRADING ORDINANCE TO PREVENT VIOLATION OF THE STATE ADMINISTRATIVE RULES, DEPARTMENT OF HEALTH, WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS. (11-54, 11-55) DUE TO EROSION AND RUN OFF TO STATE WATERS.
3. GRUB MATERIAL, DEMOLITION WASTES, AND CONSTRUCTION WASTES SHALL BE DISPOSED OF AT AN AUTHORIZED SITE HAVING A DEPARTMENT OF HEALTH SOLID WASTE MANAGEMENT PERMIT. OPEN BURNING IS PROHIBITED. THE CONTRACTOR SHALL INFORM THE COUNTY ENGINEER OF THE LOCATION OF THE DISPOSAL SITES. THE DISPOSAL SITE MUST ALSO FULFILL THE REQUIREMENTS OF THE GRADING ORDINANCES.
4. ALL EXCESS MATERIAL SHALL BE REMOVED FROM THE PROJECT SITE.
5. THE PROJECT SITE SHALL BE KEPT DAMP WITH WATER FOR SEVEN (7) DAYS A WEEK. AT THE END OF EACH DAY, THE SITE SHALL BE SUFFICIENTLY DAMPENED SO THAT THE SITE WILL REMAIN MOISTENED DURING THE NIGHT.
6. THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS SO THAT EXCAVATION, EMBANKMENT AND IMPORTED MATERIAL SHALL BE DAMPENED WITH WATER DURING THE GRADING OPERATION.

COMPOST FILTER SOCK NOTES:

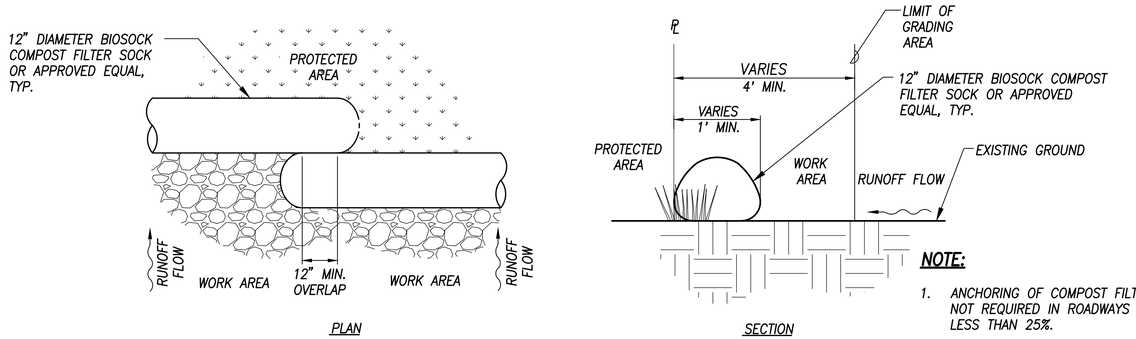
1. COMPOST FILTER SOCK SHALL UTILIZE AN OUTER LAYER OF FILTRATION MESH, AND AN INNER LAYER OF CONTAINMENT NETTING. ALL LAYERS SHALL COLLECTIVELY ENCLOSE THE COMPOST FILTRATION MEDIA. COMPOST FILTER SOCK SHALL BE INSTALLED AS 12" NOMINAL DIAMETERS AS INDICATED ON THE PROJECT DRAWINGS, OR AS SPECIFIED BY THE PROJECT ENGINEER. COMPOST FILTER SOCKS SHALL BE BIOSOCK AS MANUFACTURED BY ENVIROTECH BIOSOLUTIONS, OR APPROVED EQUAL.
2. COMPOST FILTER SOCKS SHALL BE INSTALLED ONSITE USING A COMMERCIAL PNEUMATIC BARK BLOWER. ALTERNATIVELY, COMPOST FILTER SOCKS CAN BE PRE-FABRICATED OFFSITE IN PRE-DETERMINED LENGTHS AND THEN INSTALLED ONSITE. COMPOST FILTER SOCKS SHALL BE PLACED IN THE AREAS SHOWN ON THE PROJECT DRAWINGS OR AS DESIGNATED BY THE PROJECT ENGINEER.
3. WHERE MULTIPLE SECTIONS OF COMPOST FILTER SOCKS ARE REQUIRED TO FORM A CONTINUOUS RUN, THE SECTIONS SHALL BE INSTALLED ACCORDING TO THE ATTACHED DETAILED SPECIFICATIONS FOR PERIMETER PROTECTION AND SHALL HAVE A MINIMUM OVERLAP OF 6 INCHES.
4. INSPECT COMPOST FILTER SOCKS WHEN RAIN IS FORECAST, FOLLOWING RAINFALL EVENTS, AND DAILY DURING PROLONGED RAINFALL. REPAIR, MODIFY, OR SUPPLEMENT COMPOST FILTER SOCK INSTALLATIONS AS NEEDED OR AS REQUIRED BY THE PROJECT ENGINEER.
5. MAINTAIN COMPOST FILTER SOCKS TO PROVIDE ADEQUATE SEDIMENT HOLDING CAPACITY. SEDIMENT SHOULD BE REMOVED WHEN THE SEDIMENT ACCUMULATION REACHES THREE QUARTERS (3/4) OF THE BARRIER HEIGHT. REMOVED SEDIMENT SHOULD BE INCORPORATED IN THE PROJECT AT LOCATIONS DESIGNATED BY THE PROJECT ENGINEER OR DISPOSED OF PROPERLY.
6. UPON COMPLETION OF THE PROJECT AND AFTER PERMANENT BMPS SUCH AS GRASSING HAVE BEEN ESTABLISHED, THE COMPOST FILTER SOCK'S MESH AND NETTING SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF PROPERLY.



NOTE:
CONTRACTOR TO REMOVE SEDIMENT CONTROL FILTER IN THE EVENT OF AN ABOVE AVERAGE RAINFALL AND REPLACE THE FILTER AFTER THE STORM HAS PASSED.

INLET PROTECTION AT CATCH BASIN

NOT TO SCALE



BIOSOCK COMPOST FILTER SOCK (12" DIA.)

NOT TO SCALE

NOTE:

1. ANCHORING OF COMPOST FILTER SOCKS IS NOT REQUIRED IN ROADWAYS OR ON SLOPES LESS THAN 25%.
2. COMPOST SHALL NOT CONTAIN BIOSOLIDS AND SHOULD BE CONSISTENT WITH EPA GUIDELINES.

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO — LICENSED PROFESSIONAL ENGINEER — No. 11253-C — HAWAII, U.S.A.

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SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

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Planning – Engineering – Environmental Services – Photogrammetry – Surveying – Construction Management
R. M. TOWILL CORPORATION
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494

Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

MISCELLANEOUS DETAILS – 1

DESIGNED:	AM/JB	SUBMITTED:	
DRAWN:	SF	DATE:	
CHECKED:		SCALE:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer		DRAWING NO. C015

JOB NO. F70C616E — SHEET NO. 16 OF 30 SHEETS

Fri, 29 Jan 2021 - 11:08an
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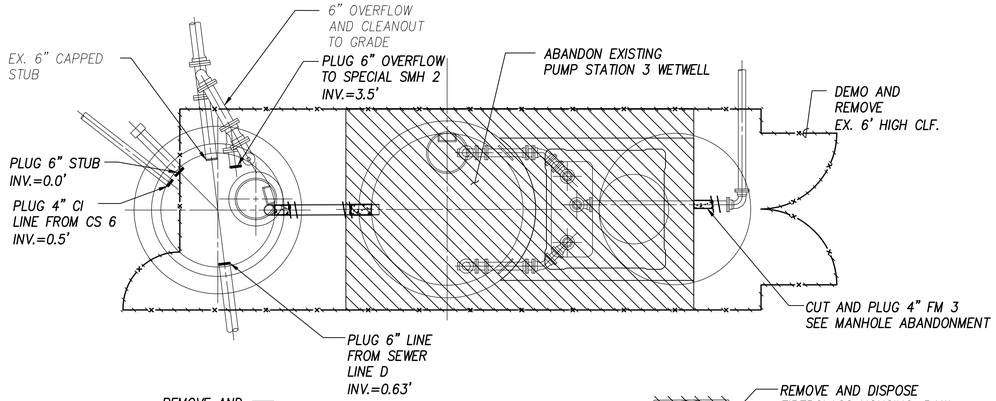
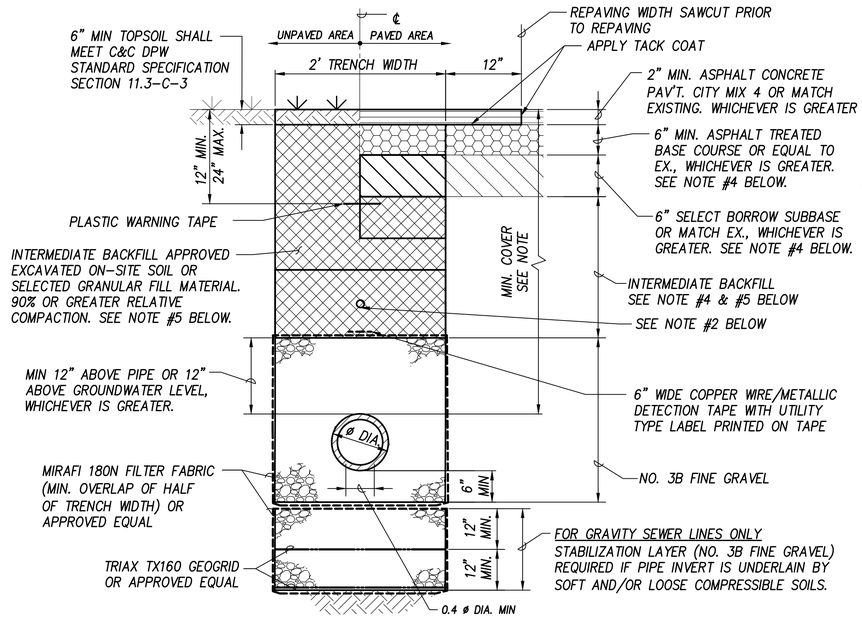
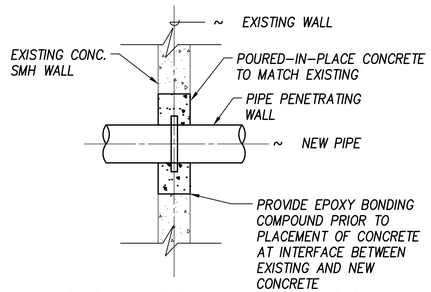


EX. PUMP STATION 3 DEMOLITION DETAIL

NOT TO SCALE





PIPE PENETRATION DETAIL

NOT TO SCALE

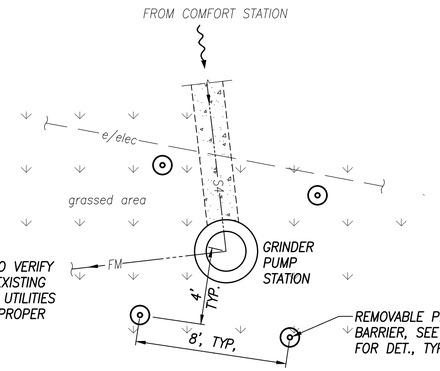
NOTES:

1. PAVEMENT STRUCTURE SHALL BE EQUAL OR BETTER THAN EXISTING PAVEMENT IN THICKNESS AND QUALITY.
2. FOR PVC PIPE, INSTALL ELECTRONIC MARKER OVER CENTERLINE OF PIPE AT A MINIMUM DEPTH OF 2 FEET AND A MAXIMUM DEPTH OF 3 FEET FROM FINISHED GRADE. INSTALL ELECTRONIC MARKER AT A MINIMUM CLEARANCE OF 6-INCHES, WHERE POSSIBLE. INSTALL MARKERS ON OR ABOVE CONCRETE JACKETS.
3. FOR GRASS AREAS, PROVIDE 6" LAYER OF TOPSOIL OR MATCH EXISTING, WHICHEVER IS GREATER, AND RE-GRASS TO MATCH EXIST.
4. UPPER 3-FT OF TRENCH BACKFILL BELOW PAVEMENT GRADE SHOULD BE COMPACTED TO AT LEAST 95% RELATIVE COMPACTION.
5. BACKFILL SHOULD BE MOISTURE-CONDITIONED TO ABOVE THE OPTIMUM MOISTURE CONTENT, PLACED IN MAXIMUM 8-IN HORIZONTAL LOOSE LIFTS, AND MECHANICALLY COMPACTED.
6. TYPICAL MINIMUM COVER:

SEWER PIPE	36"
VENT PIPE	18"

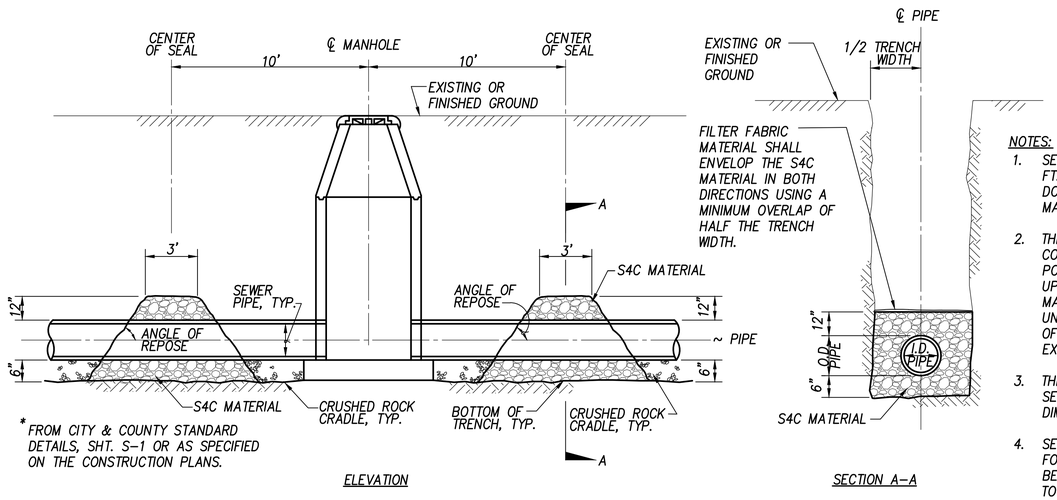
TYPICAL TRENCH DETAIL

NOT TO SCALE



REMOVABLE PIPE BARRIER INSTALLATION LAYOUT

NOT TO SCALE

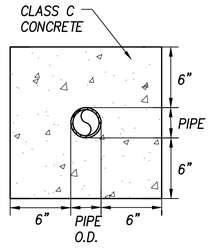


SEWER LINE SEAL AT MANHOLE (FOR PVC)

NOT TO SCALE

NOTES:

1. SEALS SHALL BE PLACED 10 FT. UPSTREAM AND DOWNSTREAM FROM EACH MANHOLE.
2. THE CONTRACTOR SHALL COMPACT S4C MATERIAL BY POUNDING AND DRAINING. UPON DRAINING, A VIBRATORY MACHINE SHALL BE USED UNTIL NO VISIBLE EVIDENCE OF FURTHER CONSOLIDATION EXISTS.
3. THE ENGINEER MAY ADJUST SEAL LOCATIONS AND DIMENSIONS AS REQUIRED.
4. SEALS SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE CONSIDERED INCIDENTAL TO CRUSHED ROCK CRADLE.



CONCRETE JACKET NOTES:

1. FOR EXISTING PVC PIPES, PROVIDE SANDED SURFACE 2' IN LENGTH AT EACH END PRIOR TO INSTALLING CONCRETE JACKET PER STANDARD SPECIFICATIONS. DEFLECTION COUPLING OR BELL NOT REQUIRED AT ENDS

PLAIN CONCRETE JACKET

NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 11253-C HAWAII, U.S.A.

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R. M. TOWILL CORPORATION
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Department of Land and Natural Resources

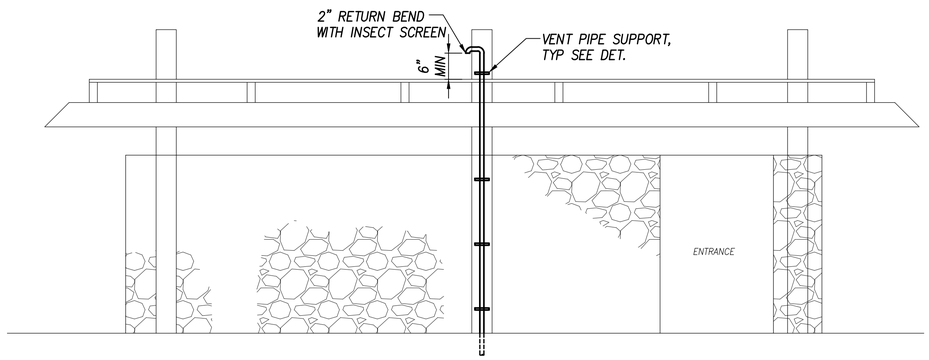
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

SEWER DETAILS – 1

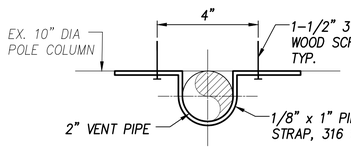
DESIGNED:	AM/JB	SUBMITTED:	
DRAWN:	SF	DATE:	
CHECKED:		SCALE:	
APPROVED:			DRAWING NO. C016

Carty Chang
E-signed 2021-02-03 09:39AM HST
carty.s.chang@hawaii.gov
State of Hawaii
Chief Engineer

JOB NO. F70C616E SHEET NO. 17 OF 30 SHEETS

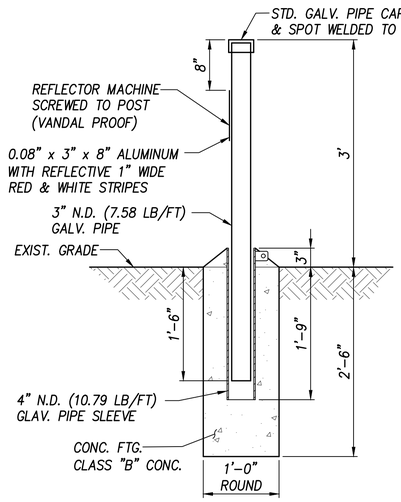


VENT DETAIL
NOT TO SCALE

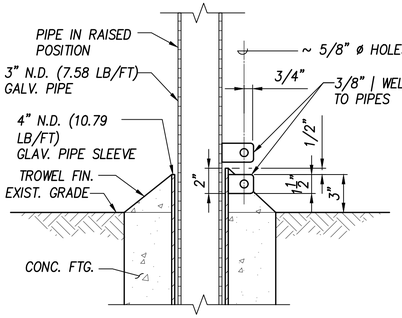


NOTE:
1. PAINT ABOVEGROUND VENT PIPING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION, TO MATCH EXISTING BUILDING.
2. ABOVE GROUND VENT PIPE TO BE UV-INHIBITED PVC PIPE

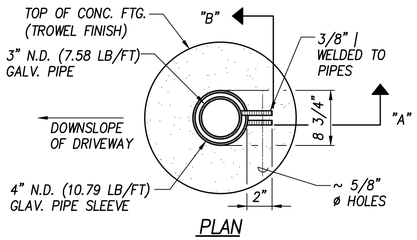
VENT PIPE SUPPORT DETAIL
NOT TO SCALE



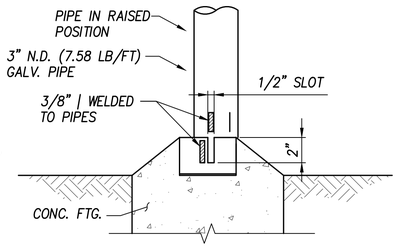
ELEVATION



SECTION "A"



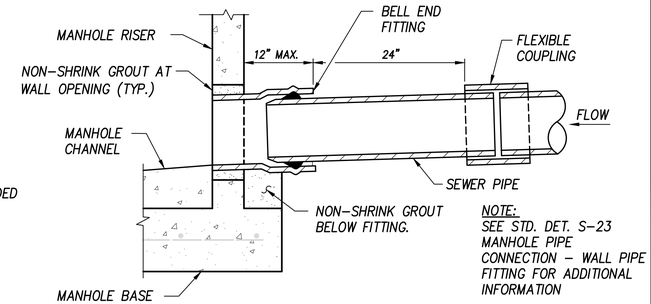
PLAN



SECTION "B"

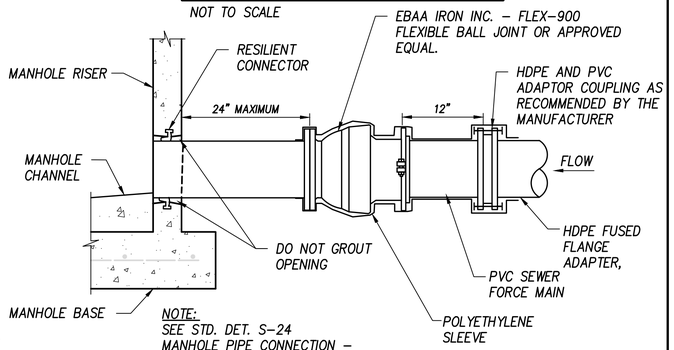
NOTE:
CONTRACTOR SHALL PROVIDE LOCK AND KEY FOR ALL PIPE BARRIERS

REMOVABLE PIPE BARRIER DETAIL
NOT TO SCALE



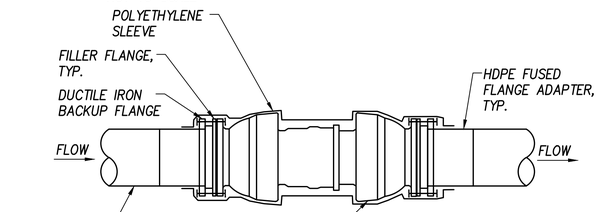
NOTE:
SEE STD. DET. S-23 MANHOLE PIPE CONNECTION - WALL PIPE FITTING FOR ADDITIONAL INFORMATION

GRAVITY SEWER PIPE PENETRATION IN NEW SMH WALL DETAIL
NOT TO SCALE



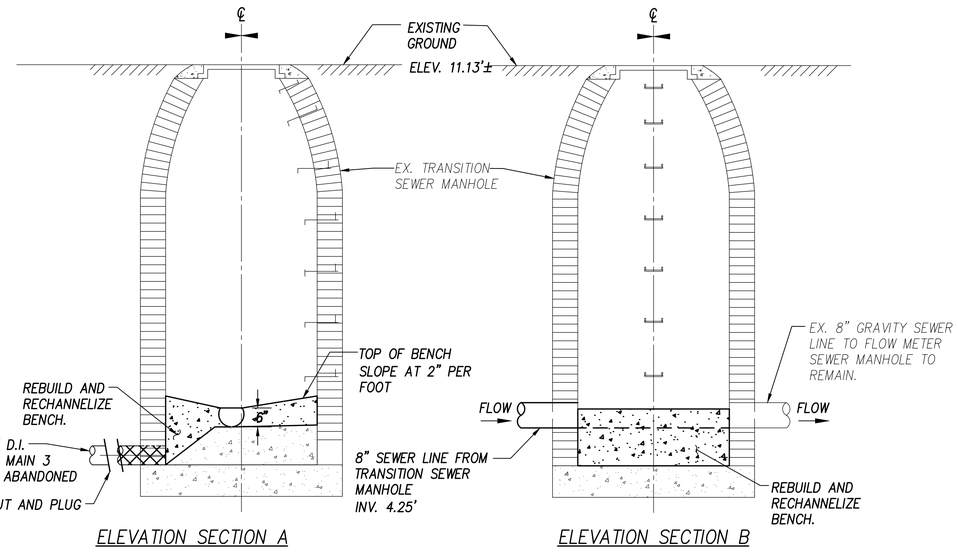
NOTE:
SEE STD. DET. S-24 MANHOLE PIPE CONNECTION - RESILIENT CONNECTOR FOR ADDITIONAL INFORMATION

SEWER FORCE MAIN PIPE PENETRATION IN NEW SMH WALL DETAIL
NOT TO SCALE



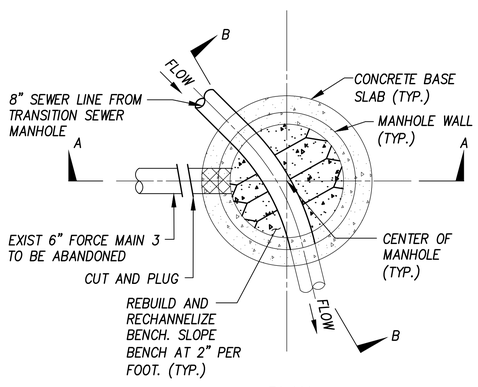
NOTE:
USE COHESION-LESS GRANULAR BACKFILL (LIKE PEA GRAVEL OR SAND).

FLEXIBLE EXPANSION JOINT CONNECTION
NOT TO SCALE



ELEVATION SECTION A

ELEVATION SECTION B



PLAN

RECHANNELIZATION OF EX. TRANSITION SEWER MANHOLE DETAIL
NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 11253-C HAWAII, U.S.A.

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Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

SEWER DETAILS - 2

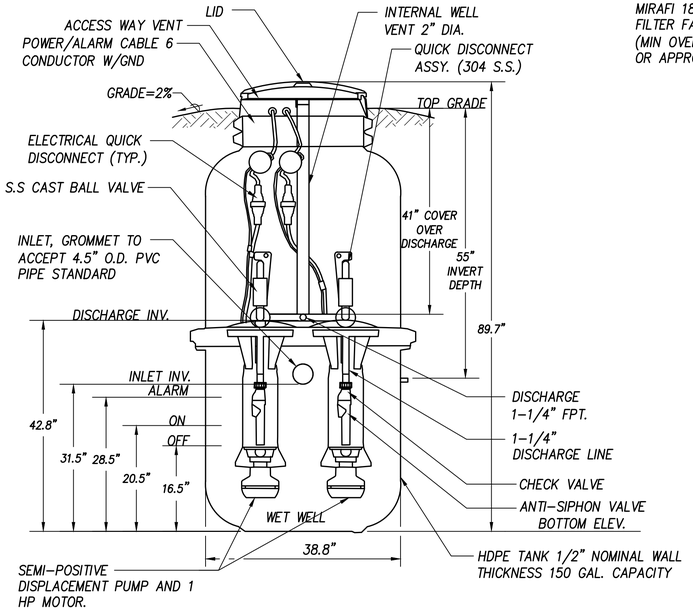
DESIGNED:	AM/JB	SUBMITTED:	
DRAWN:	SF	DATE:	
CHECKED:		SCALE:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer		DRAWING NO. C017

JOB NO. F70C616E SHEET NO. 18 OF 30 SHEETS

PUMP STATION EMERGENCY OPERATIONS PLAN

DLNR'S SHALL PERFORM THE FOLLOWING TO PREVENT UNAUTHORIZED DISCHARGE OF WASTEWATER IN THE EVENT OF POWER OUTAGE OR BREAKDOWN OF PUMP STATION.

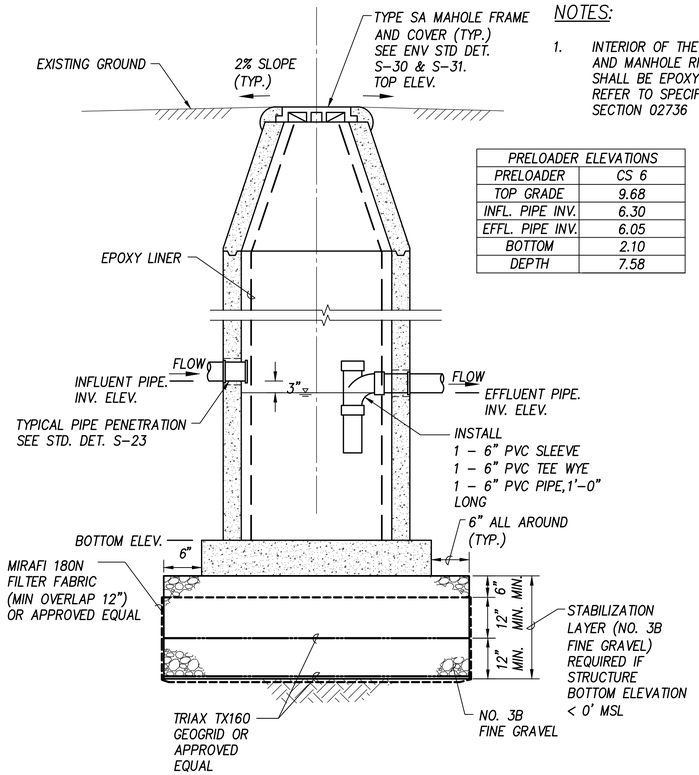
1. PUMP STATION EMERGENCY FEATURES:
   - A. IN THE EVENT OF A POWER OUTAGE LASTING MORE THAN (1) ONE MINUTE, AN AUTOMATIC ALARM WILL BE TRIGGERED AND THE AUTO-DIALER SYSTEM WILL NOTIFY THE DIVISION OF STATE PARKS SUPERINTENDENT AT PHONE NUMBER 808-733-9102.
   - B. QUICK CONNECT FOR PORTABLE GENERATOR. GENERATOR REQUIREMENS (10 KW HONDA EB10000, OR SIMILAR)
2. STANDARD OPERATING PROCEDURES FOR POWER OUTAGE OR PUMP BREAKDOWN:
   - A. STATE PARKS SUPERINTENDENT TO COORDINATE SHUTTING OFF THE COMFORT STATION WATER SUPPLY AND CLOSING THE COMFORT STATION UNTIL POWER IS RESTORED OR PUMPS REPAIRED.
3. ALTERNATIVE TO CLOSING COMFORT STATION:
   - A. STATE PARKS SUPERINTENDENT TO COORDINATE OBTAINING PORTABLE GENERATOR AND CONNECTING TO THE PUMP SYSTEM. PORTABLE GENERATOR TO BE STORED AT SAND ISLAND RECREATIONAL AREA MAINTENANCE YARD STORAGE BUILDING.
   - B. STATE PARKS SUPERINTENDENT CAN COORDINATE AND SCHEDULE PUMP TRUCK TO PUMP OUT WASTEWATER.



GRINDER PUMP ELEVATION	
PUMP STATION	CS6
TOP GRADE	9.18
DISCHARGE	5.76
INLET INV.	4.60
ALARM	4.57
ON	3.90
OFF	3.57
BOTTOM	2.20

NOTES:
1. PUMP STATION SHALL BE ENVIRONMENT ONE (E/ONE) CORPORATION MODEL NUMBER DH152 OR APPROVED EQUAL.
2. DIMENSIONS AND CONTROL ELEVATIONS SHOWN ARE BASED ON E/ONE'S PRODUCT INFORMATION
3. FOR CONCRETE BALLAST, SEE THIS SHT FOR DETAIL

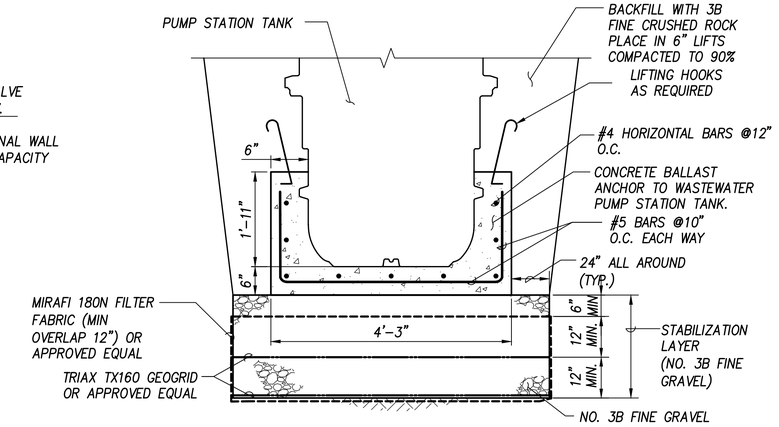
GRINDER PUMP STATION AT CS6 DETAIL
NOT TO SCALE



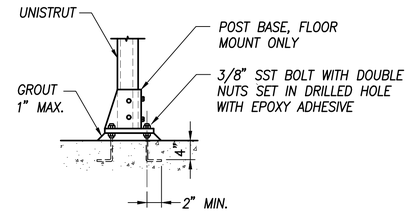
PRELOADER ELEVATIONS	
PRELOADER	CS 6
TOP GRADE	9.68
INFL. PIPE INV.	6.30
EFFL. PIPE INV.	6.05
BOTTOM	2.10
DEPTH	7.58

NOTES:
1. INTERIOR OF THE TANK AND MANHOLE RISERS SHALL BE EPOXY COATED. REFER TO SPECIFICATION SECTION 02736

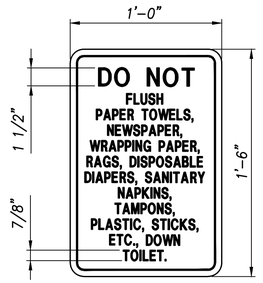
PRELOADER CS6 DETAIL
NOT TO SCALE



CONCRETE BALLAST FOR PUMP STATION DETAIL
NOT TO SCALE

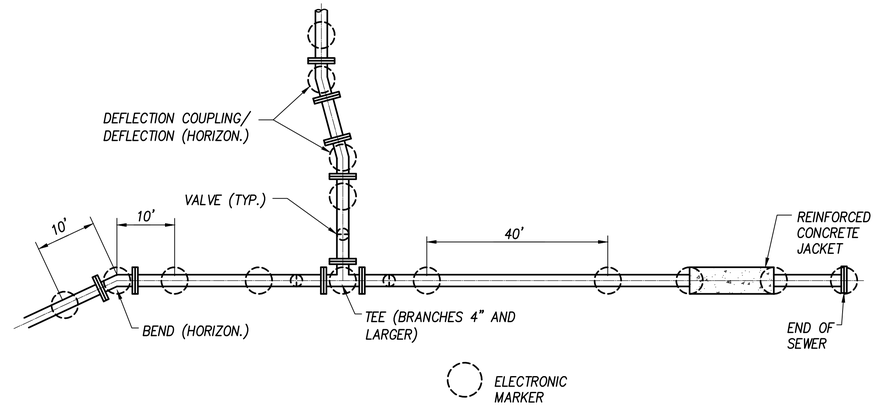


PANEL SUPPORT DETAIL
NOT TO SCALE



NOTES:
1. FURNISH SIX (6) SIGNS. INSTALL ONE SIGN IN EACH STALL. THE SIGN SHOULD BE ABOVE THE TOILET/URINAL, WITH THE CENTERLINE OF THE SIGN AT 5 FEET ABOVE THE FINISHED FLOOR.
2. SIGN SHALL BE ANODIZED ALUMINUM, 1/16 THICK ENGINEER GRADE.
3. TEXT SHALL BE BLACK ON WHITE (NON-GLARE) BACKGROUND.
4. SIGN SHALL BE MOUNTED ON WALL WITH 1/4 INCH DIAMETER NON-REMOVABLE STAINLESS STEEL BOLTS WITH EXPANSION ANCHORS IN MASONRY, 1/4 INCH DIAMETER NON-REMOVABLE STAINLESS STEEL SCREW IN WOOD.
5. CONTRACTOR SHALL COORDINATE WITH ENGINEER-IN-CHARGE TO OPEN COMFORT STATION TO INSTALL SIGNS AND RE-CLOSE ENTRANCE WITH EXISTING MATERIALS. PROVIDE ADDITIONAL REINFORCEMENT BOARDS AS NECESSARY.

SPECIAL SIGN DETAIL
NOT TO SCALE



TYPICAL ELECTRONIC MARKER FOR PVC PIPE (PLAN VIEW)
NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 11253-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE APRIL 30, 2020 LIC. EXP. DATE

"OBSERVATION OF CONSTRUCTION" IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

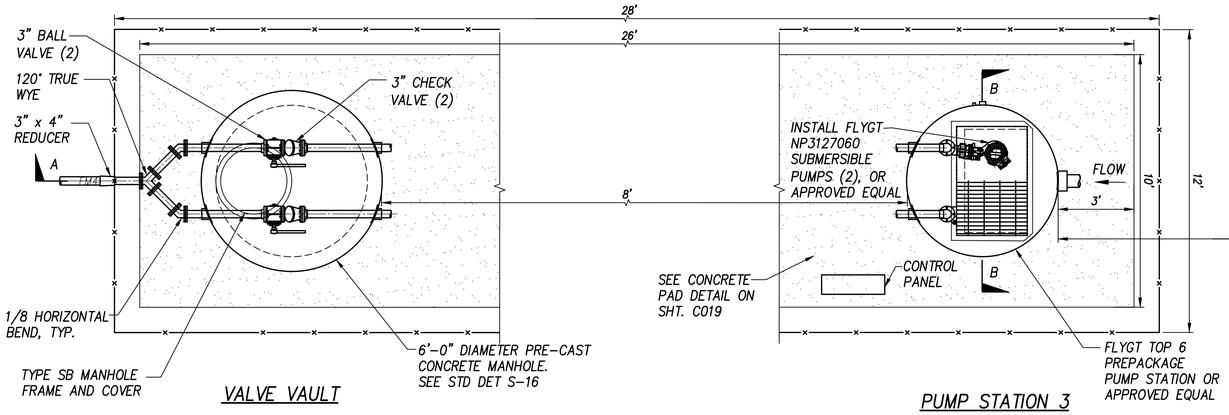
Planning - Engineering - Environmental Services - Photogrammetry - Surveying - Construction Management
R. M. TOWILL CORPORATION
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494

Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

SEWER DETAILS - 3

DESIGNED:	AM/JB	SUBMITTED:	
DRAWN:	SF	DATE:	
CHECKED:		SCALE:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer		DRAWING NO. C018

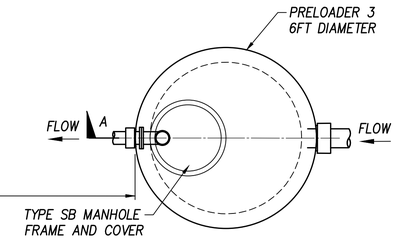
JOB NO. F70C616E SHEET NO. 19 OF 30 SHEETS



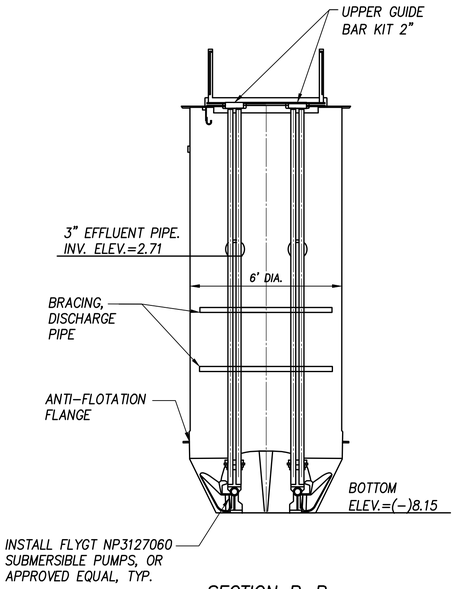
VALVE VAULT

PUMP STATION 3

PLAN



PRELOADER 3



SECTION B-B

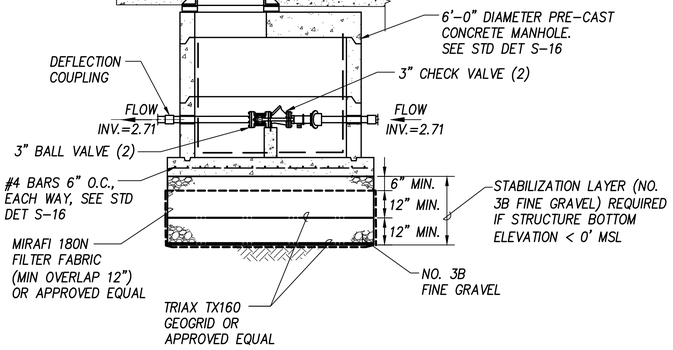
SEWER PUMP STATION 3 DETAIL

SCALE: 1" = 3'

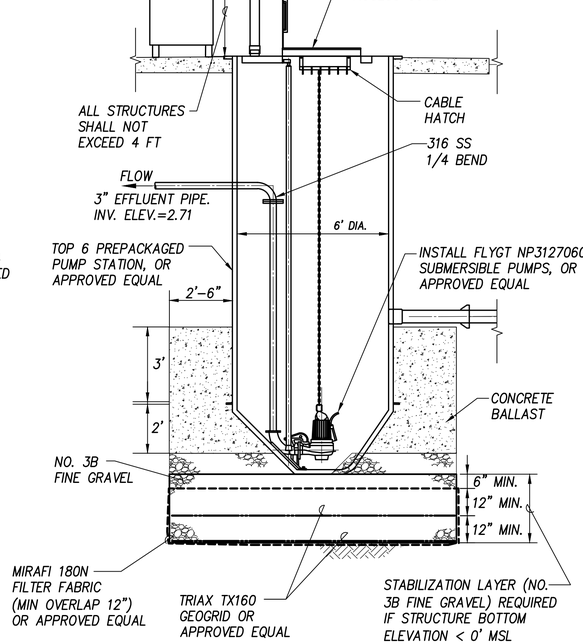
PUMP STATION 3 ELEVATIONS			
PUMP STATION	PRELOADER	PS 3	VALVE VAULT
TOP GRADE	8.22	8.00	8±
DISCHARGE	-2.31	2.71	2.71
INLET INV.	-2.56	-2.56	2.71
ALARM	---	---	---
ON	---	---	---
OFF	---	---	---
BOTTOM	-6.06	-8.15	1.34
DEPTH	14.28	16.15	6.66

NOTE:

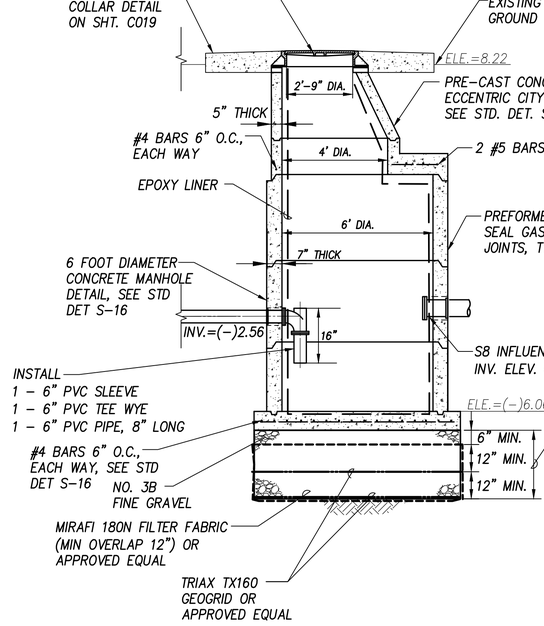
1. ALL BOLT PENETRATION THROUGH WALL MUST BE SEALED WITH SILICONE SEALANT.



STA. 0+14
VALVE VAULT



STA. 0+00
PUMP STATION 3



STA. -0+14
PRELOADER 3

SECTION A-A

PRELOADER 3, SEWER PUMP STATION 3, AND PRELOADER DETAIL

SCALE: 1" = 3'

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

Planning - Engineering - Environmental Services - Photogrammetry - Surveying - Construction Management
R. M. TOWILL CORPORATION
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494

Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

SEWER DETAILS - 4

ANN Y.M. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 11253-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE
APRIL 30, 2020
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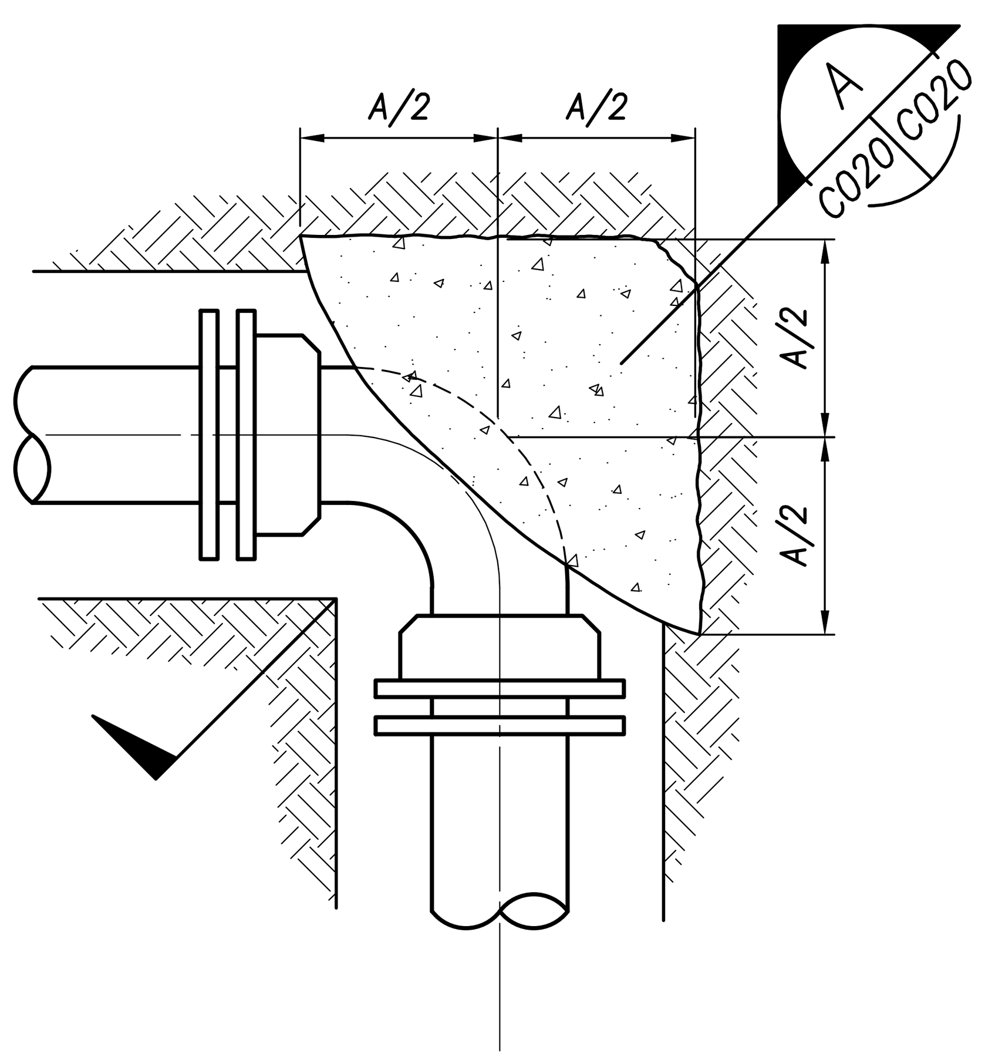
DESIGNED:	AM/JB
DRAWN:	SF
CHECKED:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer
SUBMITTED:	
DATE:	
SCALE:	

DRAWING NO. C019

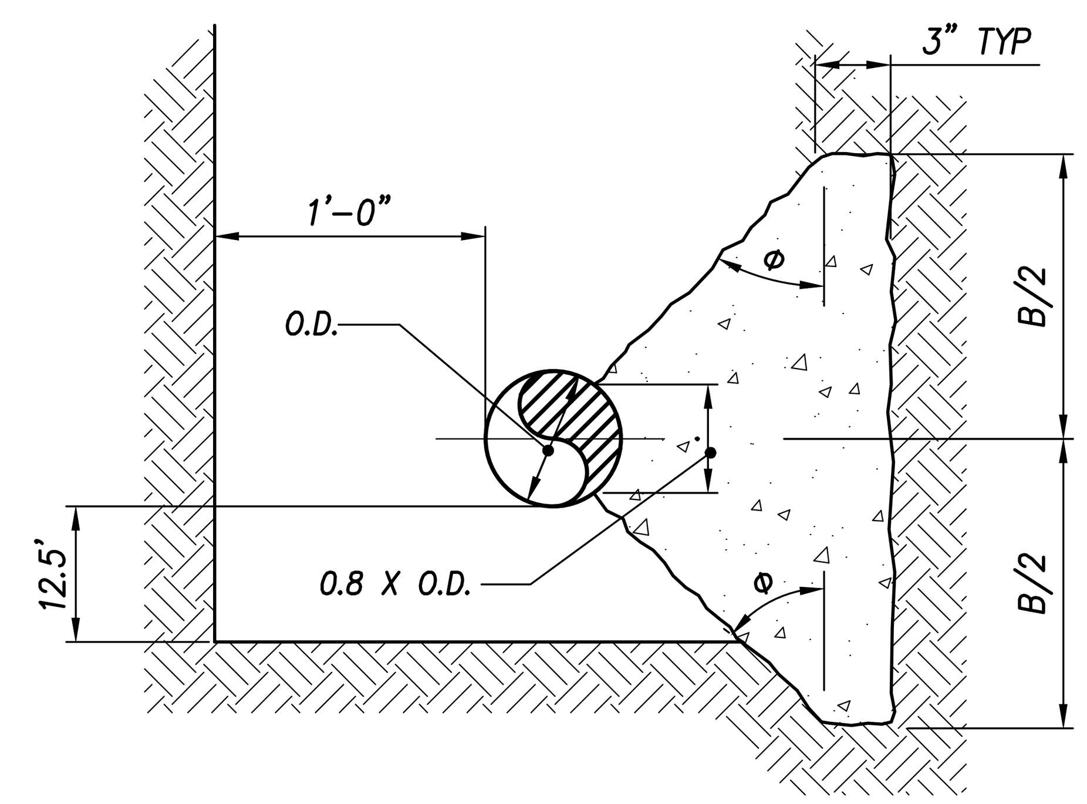
JOB NO. F70C616E SHEET NO. 20 OF 30 SHEETS

STANDARD THRUST BLOCK SCHEDULE – ENGINEERED FILL MATERIAL

NOMINAL PIPE DIAMETER (INCHES)	TEST PRESSURE (PSI)	DEAD ENDS AND TEES			ANGLE ø (DEG)	HORIZONTAL BENDS LESS THAN OR EQUAL TO ANGLE																			
						11–1/4°		22–1/2°		45°		90°		ALL ANGLES	ALTERNATE DETAIL D				UPWARD		DOWNWARD				ALL BENDS
															11–1/4°	22–1/2°	45°	90°	45°	90°	45°		90°		
		A	B	C		A	B	A	B	A	B	A	B	C	L	L	L	L	F	F	D	E	D	E	C
4	0–30	1'–0"	1'–6"	4"	+45	1'–0"	1'–6"	1'–0"	1'–6"	1'–0"	1'–6"	1'–0"	1'–6"	4"	1'–0"	1'–0"	1'–0"	1'–0"	1'–0"	1'–0"	1'–0"	1'–6"	1'–6"	2'–6"	4"
4	30–75	1'–6"	1'–6"	4"	+45	1'–0"	1'–6"	1'–0"	1'–6"	1'–0"	1'–6"	1'–6"	1'–6"	4"	1'–0"	1'–0"	1'–0"	2'–0"	1'–0"	1'–0"	1'–6"	2'–6"	2'–0"	4'–0"	4"
4	75–150	2'–6"	1'–6"	4"	+45	1'–0"	1'–6"	1'–0"	1'–6"	2'–0"	1'–6"	3'–0"	1'–6"	4"	1'–0"	1'–0"	1'–6"	4'–0"	1'–0"	2'–0"	2'–0"	3'–6"	2'–6"	5'–0"	4"
4	150–225	3'–6"	1'–6"	4"	+45	1'–0"	1'–6"	1'–6"	1'–6"	2'–6"	1'–6"	4'–6"	1'–6"	4"	1'–0"	1'–6"	2'–6"	5'–6"	1'–6"	3'–0"	2'–6"	4'–6"	3'–0"	6'–0"	4"
6	0–30	1'–0"	2'–0"	6"	+45	1'–0"	2'–0"	1'–0"	2'–0"	1'–0"	2'–0"	1'–0"	2'–0"	6"	1'–0"	1'–0"	1'–0"	1'–6"	1'–0"	1'–0"	1'–6"	2'–6"	2'–0"	3'–6"	6"
6	30–75	2'–0"	2'–0"	6"	+45	1'–0"	2'–0"	1'–0"	2'–0"	1'–6"	2'–0"	2'–6"	2'–0"	6"	1'–0"	1'–0"	1'–6"	3'–6"	1'–6"	2'–0"	2'–0"	3'–6"	2'–6"	5'–0"	6"
6	75–150	3'–6"	2'–0"	6"	+45	1'–0"	2'–0"	1'–6"	2'–0"	3'–0"	2'–0"	5'–0"	2'–0"	6"	1'–0"	1'–6"	3'–0"	7'–0"	2'–6"	4'–0"	2'–6"	5'–0"	3'–6"	7'–0"	6"
6	150–225	5'–6"	2'–0"	6"	+45	1'–0"	2'–0"	2'–0"	2'–0"	4'–0"	2'–0"	6'–0"	2'–0"	6"	1'–6"	2'–6"	4'–6"	10'–6"	3'–6"	6'–0"	3'–0"	6'–0"	4'–0"	8'–0"	6"



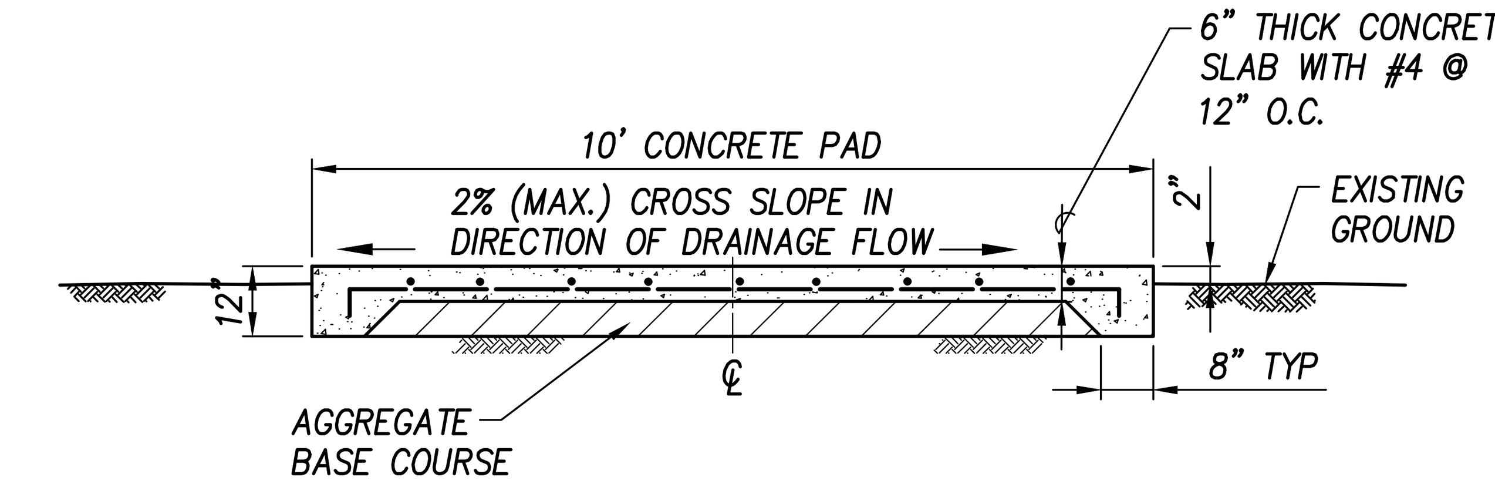
HORIZONTAL BEND DETAIL
NOT TO SCALE
1
VAR | C020



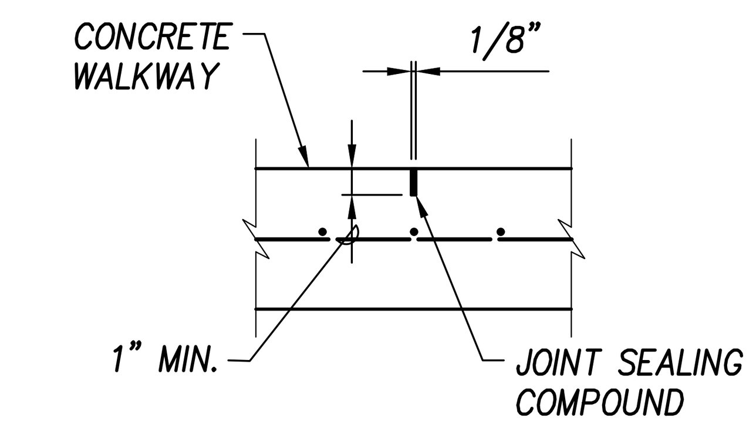
SECTION
NOT TO SCALE
A
C020 | C020

NOTES:

1. THRUST BLOCK SIZES BASED ON A UNIT PASSIVE SOIL PRESSURE OF 300 PSF PER FOOT OF DEPTH, ABOVE GROUNDWATER AND 150 PSF PER FOOT OF DEPTH BELOW GROUNDWATER, MINIMUM SOIL COVER OF 2'–6".
2. THRUST BLOCKS SHALL BE POURED SOLIDLY AGAINST FIRM, UNDISTURBED SOIL WITH PASSIVE PRESSURE EQUAL TO OR GREATER THAN THAT SHOWN IN NOTE 1.
3. IF LOOSE OR PREVIOUSLY BACKFILLED SOILS ARE ENCOUNTERED, CONTRACTOR SHALL NOTIFY THE ENGINEER WHO MAY ADJUST THE DIMENSIONS SHOWN IN THE SCHEDULE.
4. CONCRETE COMPRESSIVE STRENGTH SHALL MEET SPECIFICATIONS FOR 2500 PSI AT 28 DAYS CURING WHEN TESTED IN ACCORDANCE WITH ASTM C94.
5. DIMENSIONS SHOWN REFER TO THRUST BLOCK DETAILS "A" THROUGH "I", AND ARE MINIMUM VALUES ONLY.
6. MINIMUM C–DIMENSIONS SHOWN ON THE DETAILS SHALL BE EQUAL TO PIPE OD.
7. CONCRETE SHALL NOT EXTEND BEYOND THE ENDS OF PIPE FITTINGS WITHOUT APPROVAL OF THE ENGINEER.
8. MINIMUM VALUE OF THRUST ø SHALL BE 45 DEGREES.
9. WHERE THERE IS INADEQUATE SPACE FOR DETAIL "A" THRUST BLOCK AT ANY HORIZONTAL BEND, DETAIL "D" SHALL BE USED.
10. TYPE D, AND TYPE F, THRUST BLOCKS ARE ALTERNATES TO BE USED WHERE SPECIFIED OR DIRECTED BY THE ENGINEER.

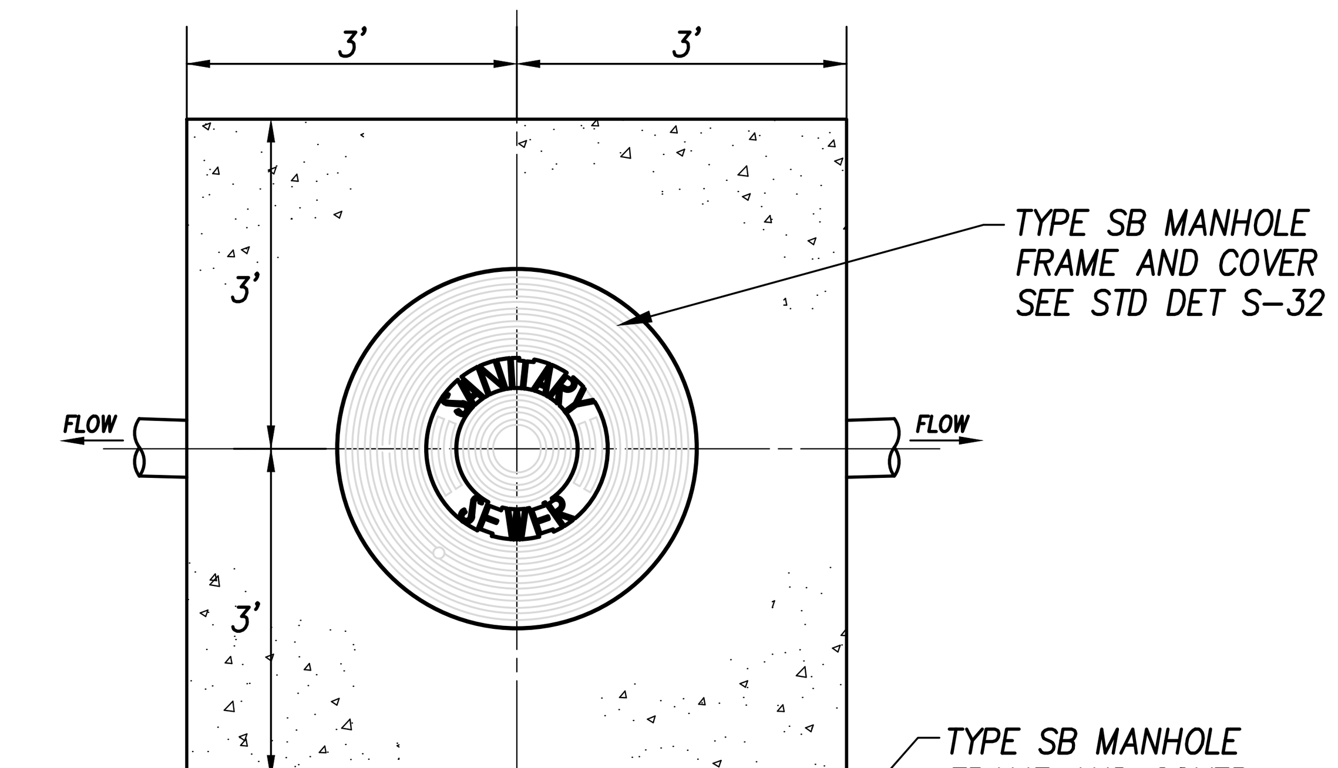


TYPICAL CONCRETE PAD SECTION

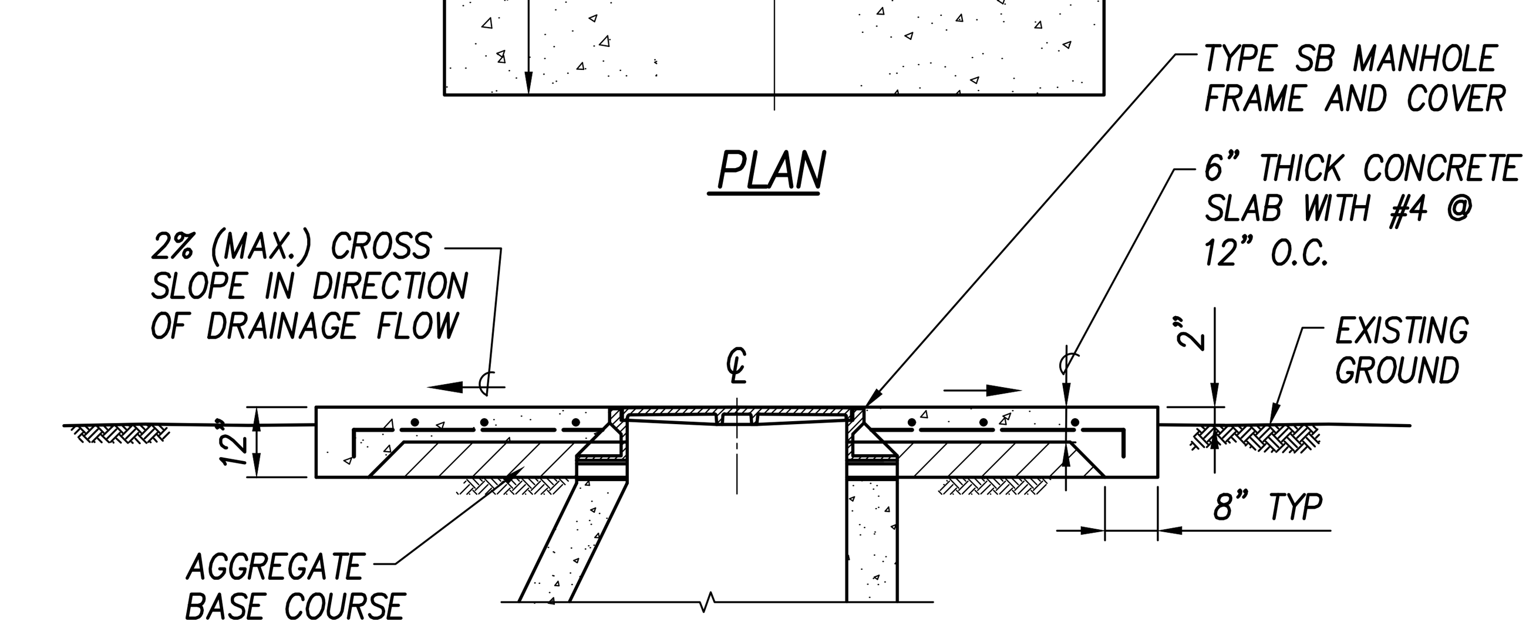


CONCRETE PAD CONTRACTION JOINT DETAIL

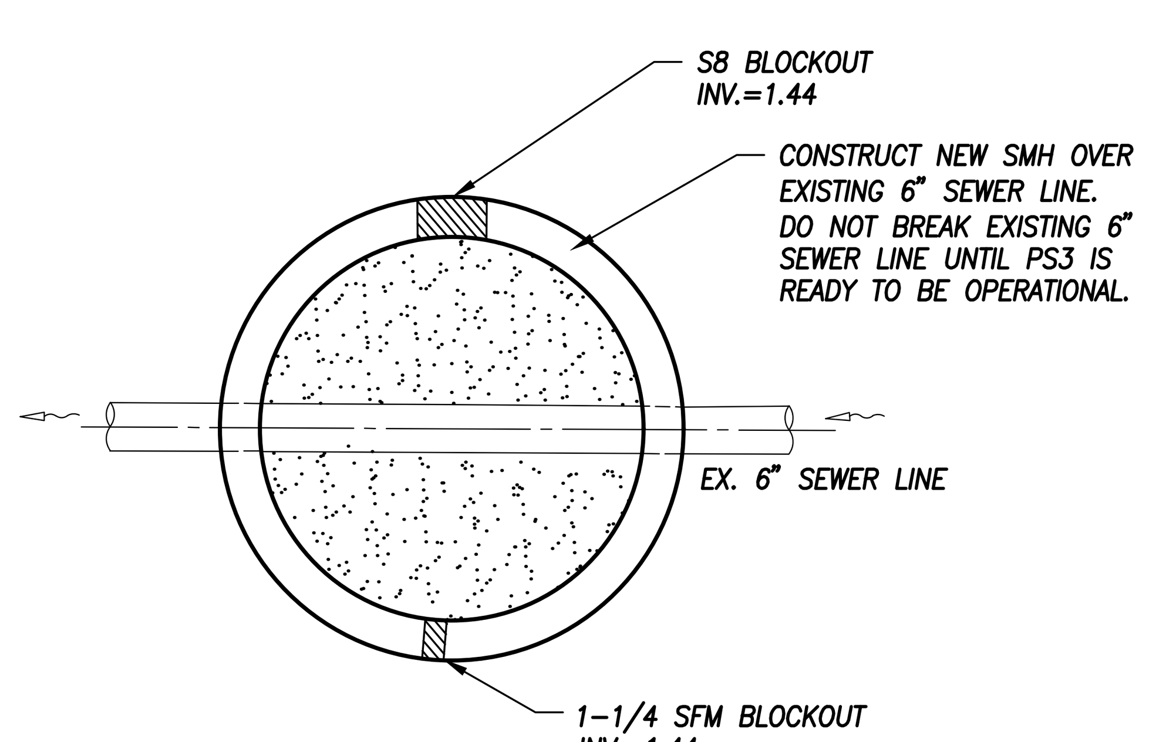
TYPICAL CONCRETE PAD DETAIL
NOT TO SCALE



PLAN



CONCRETE COLLAR DETAIL
NOT TO SCALE

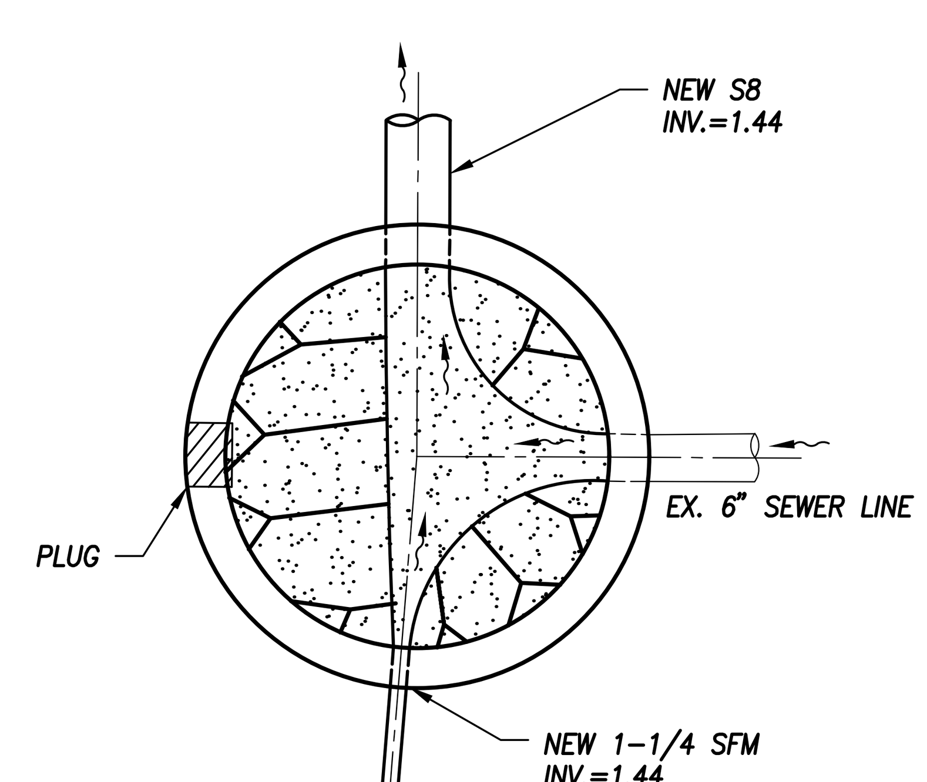


PLAN VIEW

NOTES:

1. EXISTING 6" SEWER LINE STILL IN USE.
2. DO NOT CHANNELIZE NEW SMH BASE.
3. DO NOT REMOVE OR BREAK EXISTING EXISTING 6" SEWER LINE.
4. CONSTRUCT 8" AND 1–1/4" BLOCKOUT.

PHASE 2 – SMH D1 DETAIL
NOT TO SCALE



PLAN VIEW

NOTES:

1. CHANNELIZE NEW SMH D1.
2. CUT AND PLUG EXISTING SEWER LINE.

PHASE 4 – SMH D1 DETAIL
NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 11253-C
HAWAII, U.S.A.

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SIGNATURE — APRIL 30, 2020 — LIC. EXP. DATE

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Planning – Engineering – Environmental Services – Photogrammetry – Surveying – Construction Management
R. M. TOWILL CORPORATION
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Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

SEWER DETAILS – 5

DESIGNED:	AM/JB	SUBMITTED:
DRAWN:	SF	DATE:
CHECKED:		SCALE:
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO. C020

JOB NO. F70C616E SHEET NO. 21 OF 30 SHEETS

GEOLABS, INC.
Geotechnical Engineering

Soil Log Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS			USCS	TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS (MORE THAN 50% OF MATERIAL RETAINED ON NO. 200 SIEVE)	GRAVELS (MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE)	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (MORE THAN 12% FINES)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS (50% OR MORE OF COARSE FRACTION PASSING THROUGH NO. 4 SIEVE)	CLEAN SANDS (LESS THAN 5% FINES)	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (MORE THAN 12% FINES)	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE-GRAINED SOILS (50% OR MORE OF MATERIAL PASSING THROUGH NO. 200 SIEVE)	SILTS AND CLAYS (LIQUID LIMIT LESS THAN 50)		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (LIQUID LIMIT 50 OR MORE)		MH	INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

LEGEND

- (2-INCH) O.D. STANDARD PENETRATION TEST
- (3-INCH) O.D. MODIFIED CALIFORNIA SAMPLE
- SHELBY TUBE SAMPLE
- GRAB SAMPLE
- CORE SAMPLE
- WATER LEVEL OBSERVED IN BORING AT TIME OF DRILLING
- WATER LEVEL OBSERVED IN BORING AFTER DRILLING
- WATER LEVEL OBSERVED IN BORING OVERNIGHT

LL LIQUID LIMIT (NP=NON-PLASTIC)
PI PLASTICITY INDEX (NP=NON-PLASTIC)
TV TORVANE SHEAR (tsf)
UC UNCONFINED COMPRESSION OR UNIAXIAL COMPRESSIVE STRENGTH
TXUU UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (ksf)

Plate A-0.1

LOG LEGEND FOR SOIL 7724A.GPJ GEOLABS.GDT 11/19/19

GEOLABS, INC.
Geotechnical Engineering

SAND ISLAND STATE RECREATION AREA
SEWER SYSTEM IMPROVEMENTS
HONOLULU, OAHU, HAWAII

Log of Boring **2**

Approximate Ground Surface Elevation (feet MSL): 9 *

Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
	13	104			34					GP ML	Gray **GRAVEL**, dry (fill)
											Brown **SANDY SILT** with some gravel (coralline), medium stiff, moist (fill)
	14				11					SP	Light tan **GRAVELLY SAND (CORALLINE)** with a little cobbles, medium dense, moist (fill)
Direct Shear	13	89			33		5				
										GM	Light gray **SILTY GRAVEL (CORALLINE)** with some sand, loose (lagoonal deposit)
	25				9		10				
											Boring terminated at 11.5 feet
							15				
							20				
							25				
							30				
							35				

Date Started:	May 25, 2018	Water Level: ▼ 5.8 ft. 05/25/2018 1421 HRS	Plate
Date Completed:	May 25, 2018		
Logged By:	B. Aiu	Drill Rig: CME-75DG2 *(Energy Transfer Ratio = 81%)*	A - 2
Total Depth:	11.5 feet	Drilling Method: 4" Solid Stem Auger	
Work Order:	7724-00	Driving Energy: 140 lb. wt., 30 in. drop	

BORING LOG 7724A.GPJ GEOLABS.GDT 10/18/19

GEOTECHNICAL NOTES:

1. A GEOTECHNICAL ENGINEERING REPORT ENTITLED "GEOTECHNICAL ENGINEERING EXPLORATION, SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROVEMENTS, HONOLULU, OAHU, HAWAII" DATED JANUARY 28, 2019 HAS BEEN PREPARED BY GEOLABS, INC. A COPY OF THE REPORT IS ON FILE AT THE OFFICE OF THE ENGINEER REVIEW BY THE CONTRACTOR.
2. FOR BORING LOCATIONS, SEE SHEET C003.
3. THE INFORMATION PRESENTED IN THE LOGS OF BORING DEPICT THE SUBSURFACE CONDITIONS ENCOUNTERED AT THAT SPECIFIED LOCATION AND AT THE TIME OF THE FIELD EXPLORATION ONLY. VARIATIONS OF SUBSOIL CONDITIONS FROM THOSE DEPICTED IN THE LOGS OF BORING MAY OCCUR BETWEEN AND BEYOND THE BORINGS
4. THE PENETRATION RESISTANCE SHOWN ON THE LOGS OF BORING INDICATE THE NUMBER OF BLOWS REQUIRED FOR THE SPECIFIC SAMPLER TYPE USED. THE BLOW COUNTS MAY NEED TO BE FACTORED TO OBTAIN THE STANDARD PENETRATION TEST (SPT) BLOW COUNTS
5. THE DATA GIVEN IS FOR GENERAL INFORMATION ONLY. BIDDERS SHALL EXAMINE THE SITE AND THE BORING DATA AND DRAW THEIR OWN CONCLUSIONS THEREFROM AS TO THE CHARACTER OF MATERIALS TO BE ENCOUNTERED. THE ENGINEER WILL NOT ASSUME RESPONSIBILITY FOR VARIATIONS OF SUBSOIL QUALITY OR CONDITIONS OTHER THAN AT THE BORING LOCATIONS SHOWN AND AT THE TIME THE BORINGS WERE TAKEN.

GEOLABS, INC.
Geotechnical Engineering

SAND ISLAND STATE RECREATION AREA
SEWER SYSTEM IMPROVEMENTS
HONOLULU, OAHU, HAWAII

Log of Boring **1**

Approximate Ground Surface Elevation (feet MSL): 8 *

Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
	15	97			41					GP ML	Gray **GRAVEL**, dry (fill)
											Brown **SANDY SILT** with some gravel (coralline), very stiff, moist (fill)
	16				27					SM MH SM	Tan **SILTY SAND (CORALLINE)** with a little gravel (coralline), dense, moist (fill)
	33	70			7		5				Reddish brown with multi-color mottling **CLAYEY SILT** with some sand and gravel (basaltic), very stiff, moist (fill)
											Tan **SILTY SAND (CORALLINE)** with some gravel, loose, moist (coralline detritus)
Sieve - #200 = 12.0%	37				4		10				
											Boring terminated at 11.5 feet
							15				* Elevations estimated from Topographic Survey Map transmitted by R.M. Towill Corporation on November 20, 2018.
							20				
							25				
							30				
							35				

Date Started:	May 26, 2018	Water Level: ▼ 8.0 ft. 05/26/2018 0832 HRS	Plate
Date Completed:	May 26, 2018		
Logged By:	N. Vaiana	Drill Rig: CME-75DG2 *(Energy Transfer Ratio = 81%)*	A - 1
Total Depth:	11.5 feet	Drilling Method: 4" Solid Stem Auger	
Work Order:	7724-00	Driving Energy: 140 lb. wt., 30 in. drop	

BORING LOG 7724A.GPJ GEOLABS.GDT 10/18/19

GEOLABS, INC.
Geotechnical Engineering

SAND ISLAND STATE RECREATION AREA
SEWER SYSTEM IMPROVEMENTS
HONOLULU, OAHU, HAWAII

Log of Boring **3**

Approximate Ground Surface Elevation (feet MSL): 6 *

Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample	Graphic	USCS	Description
	12	102			87					GP	Tan **SANDY GRAVEL (CORALLINE)** with some silt, very dense, moist (fill)
	14				19						
Direct Shear	33	84			5		5			GP-GM	Light tannish gray **SANDY GRAVEL (CORALLINE)** with a little silt and shells, loose, wet (lagoonal deposit)
Sieve - #200 = 7.5%	28				4		10				grades with less gravel
	27				4		15				grades to very loose
										GM	Light tannish gray **SILTY GRAVEL (CORALLINE)** with some sand, very loose (lagoonal deposit)
	35				2		20				
Sieve - #200 = 14.3%	35				3		25				
										SM	Light tan **SILTY SAND** with a little gravel (coralline), medium dense (coralline detritus)
	44				23		30				
											Boring terminated at 32.5 feet
							35				

Date Started:	May 26, 2018	Water Level: ▽ 5.7 ft. 05/26/2018 0926 HRS	Plate
Date Completed:	May 26, 2018		
Logged By:	N. Vaiana	Drill Rig: CME-75DG2 *(Energy Transfer Ratio = 81%)*	A - 3
Total Depth:	32.5 feet	Drilling Method: 4" Solid Stem Auger	
Work Order:	7724-00	Driving Energy: 140 lb. wt., 30 in. drop	

BORING LOG 7724A.GPJ GEOLABS.GDT 10/18/19

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

ANN Y.M. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 11253-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE APRIL 30, 2020 LIC. EXP. DATE

"OBSERVATION OF CONSTRUCTION" IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

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R. M. TOWILL CORPORATION
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494

Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

BORING LOG

DESIGNED:	AM/JB	SUBMITTED:	
DRAWN:	SF	DATE:	
CHECKED:		SCALE:	
APPROVED:	Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO.	C021

JOB NO. F70C616E SHEET NO. 22 OF 30 SHEETS

Fri, 29 Jan 2021 - 11:29am
K:\w\2021\948 02 Sand Island Park, Sewer Rig Phase 2\Drawings\Construction Dwgs\Phase 2 - PS 3 and FM 3 New Alignment\02 Boring Notes.dwg

ELECTRICAL SYMBOLS

MOUNTING HEIGHT FROM FLOOR TO		EXISTING	NEW	DESCRIPTION
TOP	℄			
	48" UON	⊏⊐┐	▬┐	FREE STANDING, DISCONNECT SWITCH, HEAVY-DUTY, HP-RATED, NEMA 4X SS (TYPE 316) UNLESS OTHERWISE INDICATED
			Ⓜ	ELECTRICAL MOTOR CONNECTION
•		⊢J⁄J	⊢J⁄J	JUNCTION BOX, LARGE, WALL/FLOOR OR CEILING MTD RESPECTIVELY. PROVIDE PADLOCK.
•		⊢Ⓙ⁄Ⓙ	⊢Ⓙ⁄Ⓙ	JUNCTION BOX, WALL/FLOOR OR CEILING MOUNTED RESPECTIVELY, 4-11/16" SQ. NOM., EXPOSED SHALL BE NEMA 4X (TYPE 316).
6'-0"		⊏⥹	▬⥹	ELECTRIC PANELBOARD, NEMA 4X STAINLESS STEEL (TYPE 316L)
			←1 , 1	NOTE INDICATOR, NOTE 1 INDICATED, ALL OTHERS SIMILAR
			⊏———	DUCT LINE STUBOUT. PROVIDE CONDUIT STUB-OUT MARKER
		——e——	———	CONDUIT CONCEALED ABOVE FINISH GRADE, 1"C MINIMUM OTHERWISE INDICATED
		– –e– –	— — —	EXPOSED CONDUIT, CEILING OR WALL MOUNTED, 1"C MINIMUM UNLESS OTHERWISE INDICATED
		∿∿∿	∿∿∿	FLEXIBLE CONDUIT, LIQUIDTIGHT, 1"C MINIMUM UNLESS OTHERWISE INDICATED
			– –C– –	CONTROL/SCADA CONDUIT
			AFD	ADJUSTABLE FREQUENCY DRIVE
			AFF	DENOTES "ABOVE FINISHED FLOOR"
			AFG	DENOTES "ABOVE FINISHED GRADE"
			CHH	CONTROL HANDHOLE
			DS	DISCONNECT SWITCH
			EHH	ELECTRICAL HANDHOLE
			GFCI	DENOTES "GROUND FAULT CIRCUIT INTERRUPTER"
			GRS	GALVANIZED RIGID STEEL
			MCP	MOTOR CIRCUIT PROTECTOR
			MH	MOUNTING HEIGHT
			PLC	PROGRAMMABLE LOGIC CONTROLLER
			SS	STAINLESS STEEL
			UON	DENOTES "UNLESS OTHERWISE NOTED"
			WP	DENOTES "WEATHERPROOF-RATED" ITEM
			XFMR	DENOTES "TRANSFORMER" ITEM

EXTERIOR ELECTRICAL SYMBOLS

EXISTING	NEW	DESCRIPTION
⊏⊐	▭ EHH	ELECTRICAL HANDHOLE, 2' X 4', LRFD, HECO #100930 OR APPROVED SUBSTSTITUTE
⊏⊐	▭ CHH	CONTROL HANDHOLE, 2' X 4', LRFD, HECO #100930 OR APPROVED SUBSTSTITUTE
	⌙Ⓐ	DUCT SECTION INDICATOR, SECTION "A" INDICATED
——e——	— - —	UNDERGROUND ELECTRIC DUCTLINE
	———a	UNDERGROUND STUB-OUT, PROVIDE CONCRETE MARKER
X		"X" THROUGH SYMBOLS INDICATES REMOVAL

SYMBOL NOTES:

1. NO HASH MARKS ON CONDUIT SYMBOL INDICATES 2-WIRES; ——||—— INDICATES 3-WIRES; ——|||—— INDICATES 4-WIRES, ETC. HASH MARKS ARE NOT SHOWN FOR GROUND AND CONTROL CONDUCTORS. PROVIDE SEPARATE INSULATED GROUND CONDUCTOR IN ALL CONDUITS (SIZE PER NEC ARTICLE 250.122). FOR LIGHTING CIRCUITS, HASH MARKS NOT INDICATED. PROVIDE NUMBER OF CONTROL CONDUCTORS AND GROUND CONDUCTOR AS REQUIRED.
2. "X" THRU SYMBOL DENOTES EXISTING ITEM TO BE REMOVED OR AS NOTED.
3. SPECIAL MOUNTING HEIGHTS INDICATED ON PLANS.
4. UNLESS OTHERWISE NOTED, DASHED SYMBOLS DENOTE "EXISTING" ITEMS AND SOLID SYMBOLS DENOTE "NEW" ITEMS.

ONE-LINE DIAGRAM SYMBOLS

SYMBOL		DESCRIPTION
EXIST	NEW	
⌒	⌒	MOLDED-CASE CIRCUIT BREAKER
⊏⁄⊐	⊏⁄⊐	DISCONNECT SWITCH, HEAVY DUTY, HP-RATED, NON-FUSIBLE
	⊠	MECHANICAL EQUIPMENT STARTER
Ⓔ	Ⓔ	ELECTRICAL EQUIPMENT CONNECTION
	≀	BUCKBOOST TRANSFORMER

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

SEY ITO JR. LICENSED PROFESSIONAL ENGINEER No. 12753-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE 2021.01.25 APRIL 30, 2022 LIC. EXP. DATE

"OBSERVATION OF CONSTRUCTION" IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

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Department of Land and Natural Resources

SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV

PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT

Sand Island, Honolulu, Oahu, Hawaii

ELECTRICAL SYMBOLS

DESIGNED: KU	SUBMITTED:
DRAWN: CAD	DATE:
CHECKED: SJI	SCALE: NOT TO SCALE
APPROVED: Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO. E-1

JOB NO. F70C616E

GENERAL ELECTRICAL NOTES

1. BEFORE ANY ELECTRICAL WIRING IS CUT, CONTRACTOR SHALL VERIFY USAGE OF WIRING TO ENSURE THAT REQUIRED SERVICES ARE NOT DISCONTINUED.

2. WHERE ELECTRICAL DEMOLITION IS INDICATED, REMOVE ALL ABANDONED CONCRETE PADS, EXISTING EXPOSED CONDUIT, AND WIRES NOT TO REMAIN IN SERVICE; CONCEALED RACEWAYS NO LONGER REQUIRED SHALL BE CAPPED AND ABANDONED IN PLACE (REMOVE AS REQUIRED TO FACILITATE NEW WORK) WITH ALL WIRES REMOVED. CUT ABANDONED UNDERGROUND CONDUIT RISER BELOW FINISH FLOOR & PATCH/RESTORE AFFECTED FLOOR AREA TO MATCH ADJACENT FINISH.

3. REMOVE ABANDONED WIRES IN DUCTS ROUTED IN CEILING SPACES. CUT EXPOSED PORTIONS OF ABANDONED DUCTS FLUSH WITH SURFACE, GROUT CLOSED, AND PATCH/RESTORE AFFECTED AREA TO MATCH ADJACENT FINISH.

4. PROVIDE WEATHERPROOF METAL SEALS FOR ALL ABANDONED RACEWAY OPENINGS (KNOCKOUTS) IN BOXES, CABINETS, AND EQUIPMENT ENCLOSURES; SEALS SHALL RETAIN NEMA RATING OF REMAINING BOXES, CABINETS, AND EQUIPMENT ENCLOSURES.

5. CONDUIT STUB-UP LOCATIONS SHOWN ARE APPROXIMATIONS ONLY. VERIFY ALL CONDUIT AND EQUIPMENT CONNECTION (PWR AND SIGNAL) LOCATIONS WITH MECHANICAL AND ELECTRICAL EQUIPMENT SHOP DRAWINGS PRIOR TO CONDUIT ROUGH-IN WORK.

6. PROVIDE 4" HIGH CONCRETE CURB AROUND CONDUITS THAT RISE EXPOSED THROUGH CONCRETE SLABS OR FINISHED GRADE.

7. ALL ITEMS SPECIFIED AS NEMA 4X SHALL BE STAINLESS STEEL (316L) UNLESS OTHERWISE INDICATED. ALL C-CHANNELS AND FASTENING HARDWARE: SCREWS, NUTS, BOLTS, WASHERS, ETC., SHALL BE STAINLESS STEEL (316L). ALL EXPOSED FACTORY PROVIDED HARDWARE NOT STAINLESS STEEL (316L) SHALL BE REPLACED WITH STAINLESS STEEL (316L) HARDWARE. PAINT ALL NEW ELECTRICAL INSTALLATIONS (EQUIPMENT AND RACEWAYS).

8. PENETRATE EXISTING WALLS, CEILINGS, AND FLOORS FOR INSTALLATION OF NEW CONDUITS AND RESTORE AFFECTED WALL AREAS TO MATCH EXISTING FIRE RATING AND ADJACENT FINISH; NOT ALL PENETRATIONS ARE INDICATED.

9. ALL ITEMS SHOWN ON DRAWINGS SHALL BE NEW UNLESS OTHERWISE INDICATED.

10. ALL ELECTRICAL EQUIPMENT SHALL BE SUITABLE FOR USE IN THE OPERATING ENVIRONMENT (INCLUDING CORROSIVE ENVIRONMENTS) PER NEC 110.11.

11. VERIFY RATINGS OF ALL ELECTRICALLY OPERATED OR CONTROLLED EQUIPMENT FURNISHED OR PROVIDED BY OTHER TRADES AT BIDDING STAGE, AT THE SHOP DRAWING STAGE AND PRIOR TO INSTALLATION. SIZE CIRCUIT BREAKERS, DISCONNECT SWITCHES, STARTERS, CONDUIT AND WIRING TO MATCH ACTUAL EQUIPMENT PROVIDED AT NO ADDITIONAL COST TO THE CITY.

12. INSTALLATION OF ELECTRICAL CONDUCTORS AND EQUIPMENT SHALL COMPLY WITH NEC 110.10.

13. ELECTRICAL EQUIPMENT SHALL BE MARKED WITH ARC FLASH WARNING SIGNS AS REQUIRED PER NEC 110.16.

14. HAZARDOUS LOCATIONS: WORK IN HAZARDOUS LOCATIONS, AS DEFINED BY NFPA 70 AND 820, SHALL BE PERFORMED IN STRICT ACCORDANCE WITH NFPA 70 FOR PARTICULAR "CLASS", "DIVISION", AND "GROUP" OF HAZARDOUS LOCATIONS INVOLVED. PROVIDE CONDUIT AND CABLE SEALS WHERE REQUIRED BY NFPA 70, EVEN THOUGH SEALS ARE NOT INDICATED ON DRAWINGS. CONDUITS SHALL HAVE TAPERED THREADS.

15. PROVIDE FIELD MARKINGS IN ACCORDANCE WITH NEC 110.24 AND 408.4(B).

16. BOXES, CONDUIT BODIES, AND HANDHOLE ENCLOSURES SHALL BE INSTALLED TO MAINTAIN ACCESS.

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

SEY ITO JR.
LICENSED PROFESSIONAL ENGINEER
No. 12753-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE APRIL 30, 2022
2021.01.25 LIC. EXP. DATE

"OBSERVATION OF CONSTRUCTION" IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

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Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

ELECTRICAL NOTES

DESIGNED: KU	SUBMITTED:
DRAWN: CAD	DATE:
CHECKED: SJI	SCALE: NOT TO SCALE
APPROVED: Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO. E-2

JOB NO. F70C616E SHEET NO. 24 OF 30 SHEETS

2020-12-14 9:41 AM Z:\CAD\PROJECTS\219195\E-2_219195_Electrical Notes

NOTE(S):

1. DEMOLISH EXISTING PUMP STATION FEEDER, UNDERGROUND DUCTS, AND HANDHOLES AFTER NEW PUMP STATION IS OPERATIONAL.
2. PROTECT ALL ADJACENT UNDERGROUND UTILITIES AS REQUIRED TO FACILITATE DEMOLITION WORK. REPAIR DAMAGED IRRIGATION LINES AS REQUIRED.
3. RESTORE EXIST SIDEWALK, OR ABANDON DUCT UNDER SIDEWALK IN PLACE.

EXIST PUMP STATION #3

EXIST COMFORT STATION #6

NORTH

DEMOLITION ELECTRICAL SITE PLAN

SCALE: 1"=50'

50' 25' 0 50' 100' 150'

SCALE: 1"=50'

GRAPHIC SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

SEY ITO JR.
LICENSED PROFESSIONAL ENGINEER
No. 12753-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE 2021.02.01 APRIL 30, 2022 LIC. EXP. DATE

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R. M. TOWILL CORPORATION

808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494

Department of Land and Natural Resources

SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

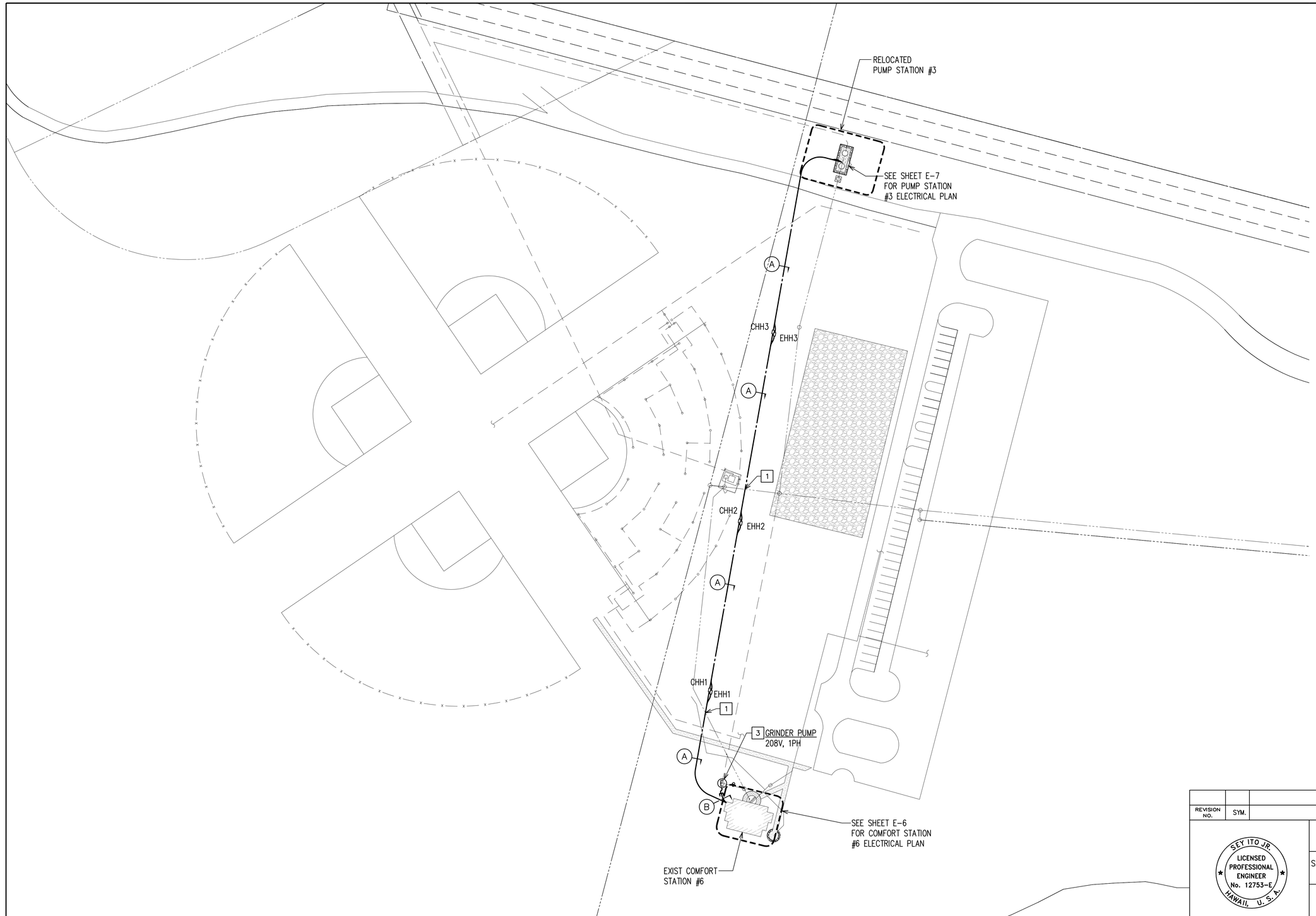
DEMO ELECTRICAL SITE PLAN

DESIGNED: KU	SUBMITTED:
DRAWN: CAD	DATE:
CHECKED: SJI	SCALE: SCALE AS NOTED
APPROVED: Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO. E-3

JOB NO. F70C616E

SHEET NO. 25 OF 30 SHEETS

2021-01-25 2:38 PM Z:\KCAD\PROJECTS\219195\E-3_219195_Demo Elec Site Plan



NOTE(S):

1. ROUTE ELECTRICAL DUCT BELOW EXIST SEWER LINE. PROVIDE 24" MINIMUM VERTICAL CLEARANCE FROM EDGE OF ELECTRICAL DUCT CONCRETE ENCASEMENT TO EDGE OF 6" SEWER LINE. SEE SHEET C009 FOR SEWER LINE PROFILE.
2. PROVIDE 36" MINIMUM HORIZONTAL CLEARANCE FROM EDGE OF ELECTRICAL DUCT CONCRETE ENCASEMENT TO EDGE OF SEWER LINE.
3. HAZARDOUS CLASSIFIED LOCATION: CLASS 1, DIVISION 1 DIAMETER OF PUMP STATION IS A HAZARDOUS CLASSIFIED AREA AS DEFINED IN NFPA 820. PROVIDE INSTALLATIONS IN ACCORDANCE WITH NEC 500 AND 501 AS APPLICABLE.

NORTH

NEW ELECTRICAL SITE PLAN

SCALE: 1"=50'

50' 25' 0 50' 100' 150'

SCALE: 1"=50'

GRAPHIC SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

SEY ITO JR.
LICENSED PROFESSIONAL ENGINEER
No. 12753-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE 2021.02.01 APRIL 30, 2022
LIC. EXP. DATE

"OBSERVATION OF CONSTRUCTION" IS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

Planning - Engineering - Environmental Services - Photogrammetry - Surveying - Construction Management
R. M. TOWILL CORPORATION
808 842 1133 2024 North King Street Suite 200 Honolulu Hawaii 96819-3494

Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

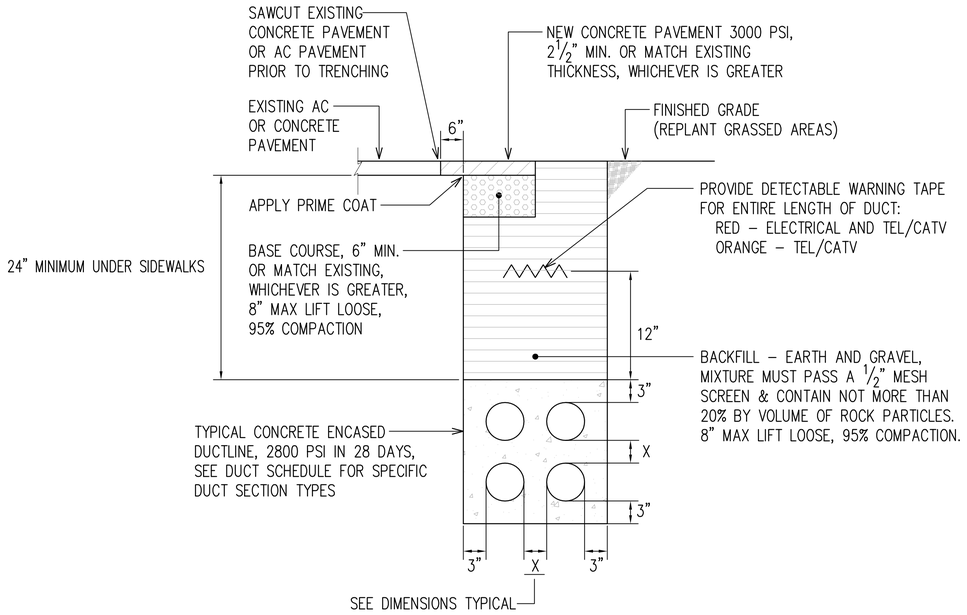
NEW ELECTRICAL
SITE PLAN

DESIGNED: KU	SUBMITTED:
DRAWN: CAD	DATE:
CHECKED: SJI	SCALE: SCALE AS NOTED
APPROVED: Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO. E-4

JOB NO. F70C616E

SHEET NO. 26 OF 30 SHEETS

2021-01-31 5:04 PM Z:\CAD\PROJECTS\219195\E-4_219195_New Elec Site Plan



NOTE(S):

1. SEE DUCT SCHEDULE FOR DUCT REQUIREMENTS.

DUCT SEPARATION REQUIREMENTS (DIMENSION "X" WITH EXCEPTIONS)

ELEC – ELEC = 2"

ELEC – TEL = 6"

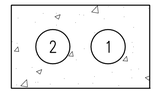
ELEC – COMM/CONTROL = 6"

TEL – COMM/CONTROL = 2"

COMM/CONTROL – COMM/CONTROL = 2"

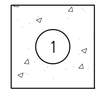
NOTES:

1. CONTRACTOR SHALL PROVIDE MULETAPE (WP 1800P) IN EACH TELEPHONE DUCT THROUGHOUT ITS ENTIRE LENGTH WITH PROTRUSIONS OF 2 FEET IN MANHOLES AND HANDHOLES AT EACH END, AND 1 FOOT IN PULLBOXES. MULETAPE SHALL BE RATED FOR 1800 LB PULL AND SHALL HAVE FOOTAGE MARKINGS FOR MEASURING DUCT LENGTHS. SEE HTCO STANDARD DRAWING 34028.
2. ELECTRICAL DUCT WARNING TAPE: A 6 INCH WIDE WARNING TAPE, RED IN COLOR WITH A BLACK IMPRINTED MESSAGE "CAUTION -- ELECTRIC LINE BURIED BELOW" SHALL BE PLACED 12 INCHES ABOVE THE CONCRETE JACKET FOR ELECTRIC DUCTS FOR THE ENTIRE DUCTLINE INSTALLATION. WARNING TAPE SHALL BE CONSTRUCTED WITH A METALLIC CORE SANDWICHED BETWEEN THE PRINTED POLYETHYLENE TAPE ABOVE AND A CLEAR POLYETHYLENE TAPE BELOW.



SECTION (A)

SECTION (B)



SECTION (C)

SECTION (D)

DUCT AND CABLE SCHEDULE

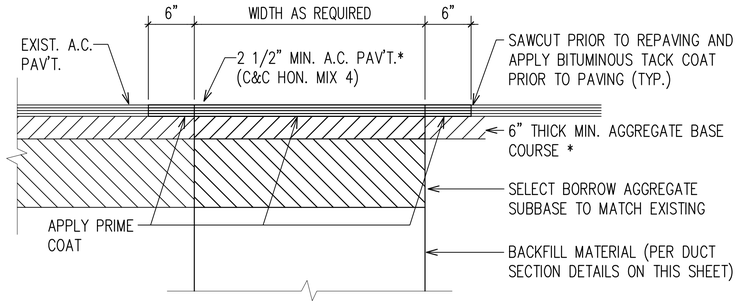
NO.	DUCT SIZE	CABLE	DESCRIPTION
1	1"C	2#10, 1#10 GND	PUMP CONTROL PANEL
2	2"C	2#1, 1#1 GND	PUMP POWER FEEDER
3	1"C	2#10, 1#10 GND, CTRL CABLES AS REQUIRED	GRINDER PUMP PANEL

DUCT SCHEDULE

SCALE: NOT TO SCALE

TYPICAL TRENCH AND BACKFILL DETAIL

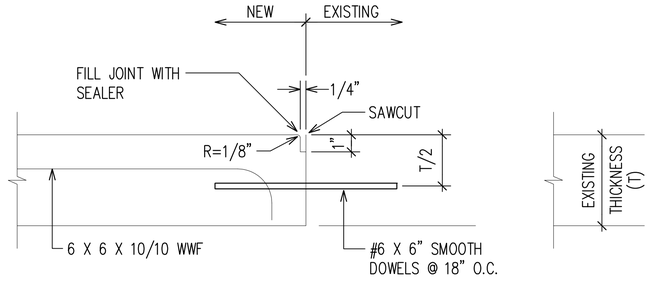
SCALE: NOT TO SCALE



* NOTE:
OR MATCH EXISTING PAVEMENT THICKNESS, WHICHEVER IS GREATER, INCLUDING A.C. AND/OR PORTLAND CONCRETE PAVEMENT, BASE COURSE AND SELECT BORROW.

TRENCH REPAVEMENT DETAIL

SCALE: NOT TO SCALE



SECTION

NOTE(S):

1. SAWCUTTING SHALL BE MADE EITHER PARALLEL OR PERPENDICULAR TO THE WALKWAY.

WALKWAY RESTORATION DETAIL

NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

SEY ITO JR. LICENSED PROFESSIONAL ENGINEER No. 12753-E HAWAII, U.S.A.

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SIGNATURE APRIL 30, 2022 LIC. EXP. DATE

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(808) 842-1133 2024 North King Street Suite 200 Honolulu, Hawaii 96819-3494

Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

DUCT SECTION DETAILS

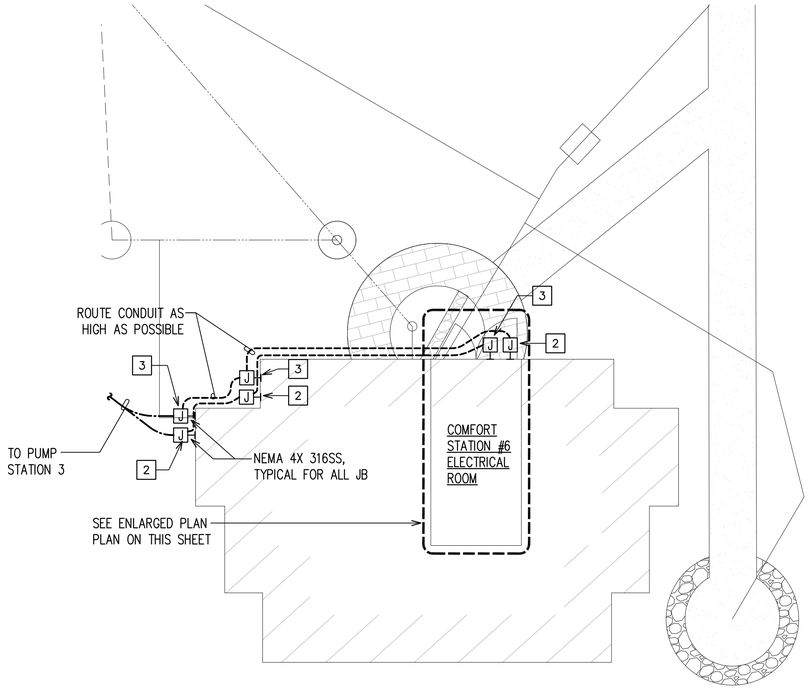
DESIGNED: KU	SUBMITTED:
DRAWN: CAD	DATE:
CHECKED: SJI	SCALE: NOT TO SCALE
APPROVED: Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Civil Engineer	DRAWING NO. E-5

JOB NO. F70C616E SHEET NO. 27 OF 30 SHEETS

2021-01-31 5:04 PM Z:\CAD\PROJECTS\219195\E-5_219195_Duct Section Detail

NOTE(S):

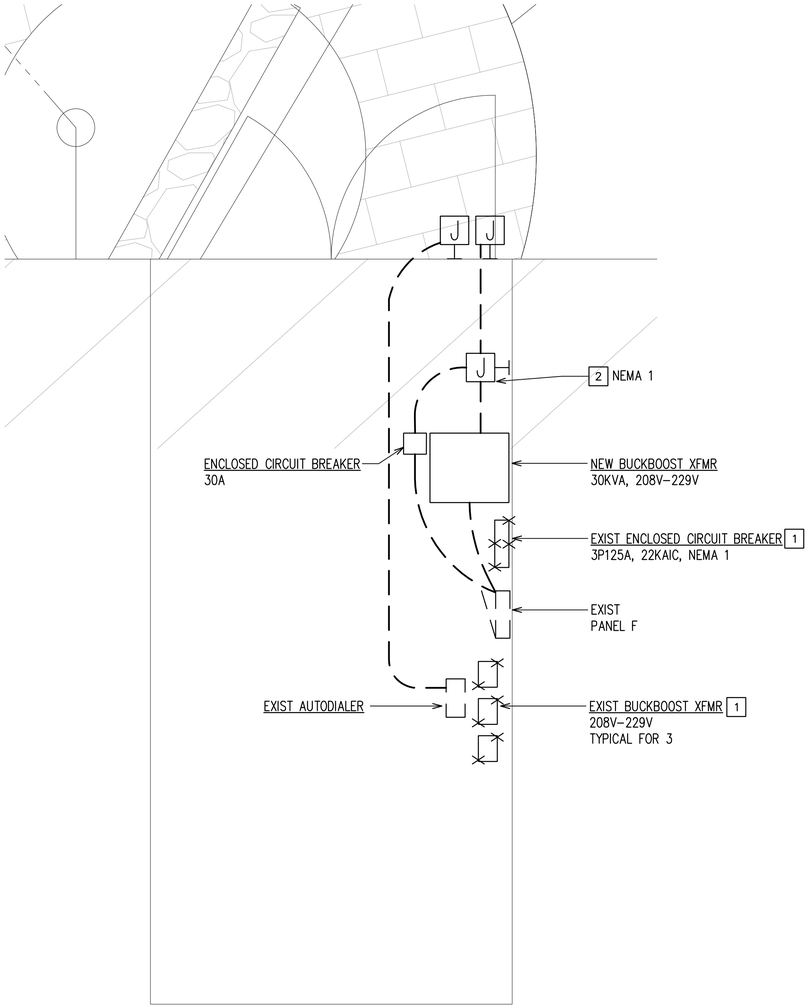
1. DEMOLISH EQUIPMENT AND ASSOCIATED WIRING AFTER AFTER NEW PUMP STATION IS OPERATIONAL.
2. 18"SQ X 4"D, MTD AS HIGH AS PRACTICABLE, WITH LOCKABLE HASP. PROVIDE PADLOCK, AMERICAN STANDARD 5560 SERIES.
3. 8"SQ X 4"D, MTD AS HIGH AS PRACTICABLE, WITH LOCKABLE HASP. PROVIDE PADLOCK, AMERICAN STANDARD 5560 SERIES.



NORTH

COMFORT STATION #6 REVISED ELECTRICAL PLAN

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



NORTH

ENLARGED PLAN

SCALE: 1/2"=1'-0"

8' 4' 0 8' 16' 24'

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

GRAPHIC SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

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PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

COMFORT STATION #6
REVISED ELECTRICAL PLAN

DESIGNED: KU	SUBMITTED:
DRAWN: CAD	DATE:
CHECKED: SJI	SCALE: SCALE AS NOTED
APPROVED: Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO. E-6

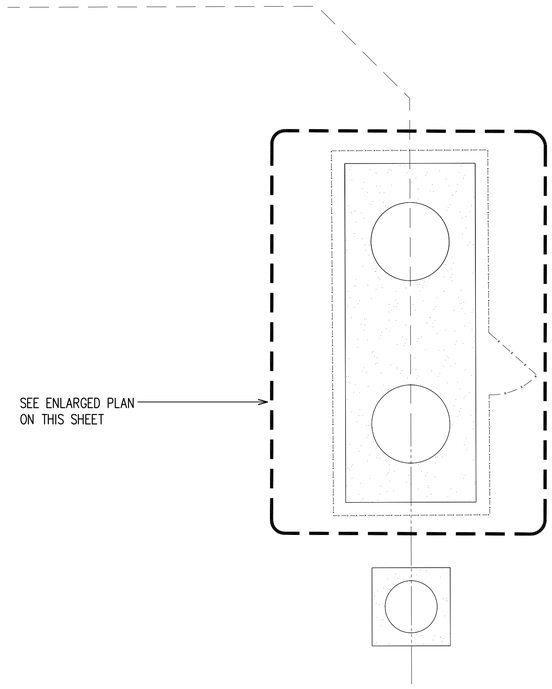
JOB NO. F70C616E

SHEET NO. 28 OF 30 SHEETS

2021-01-31 5:04 PM Z:\ACAD\PROJECTS\219195\E-6_219195_Comfort Sta Elec Plan

NOTE(S):

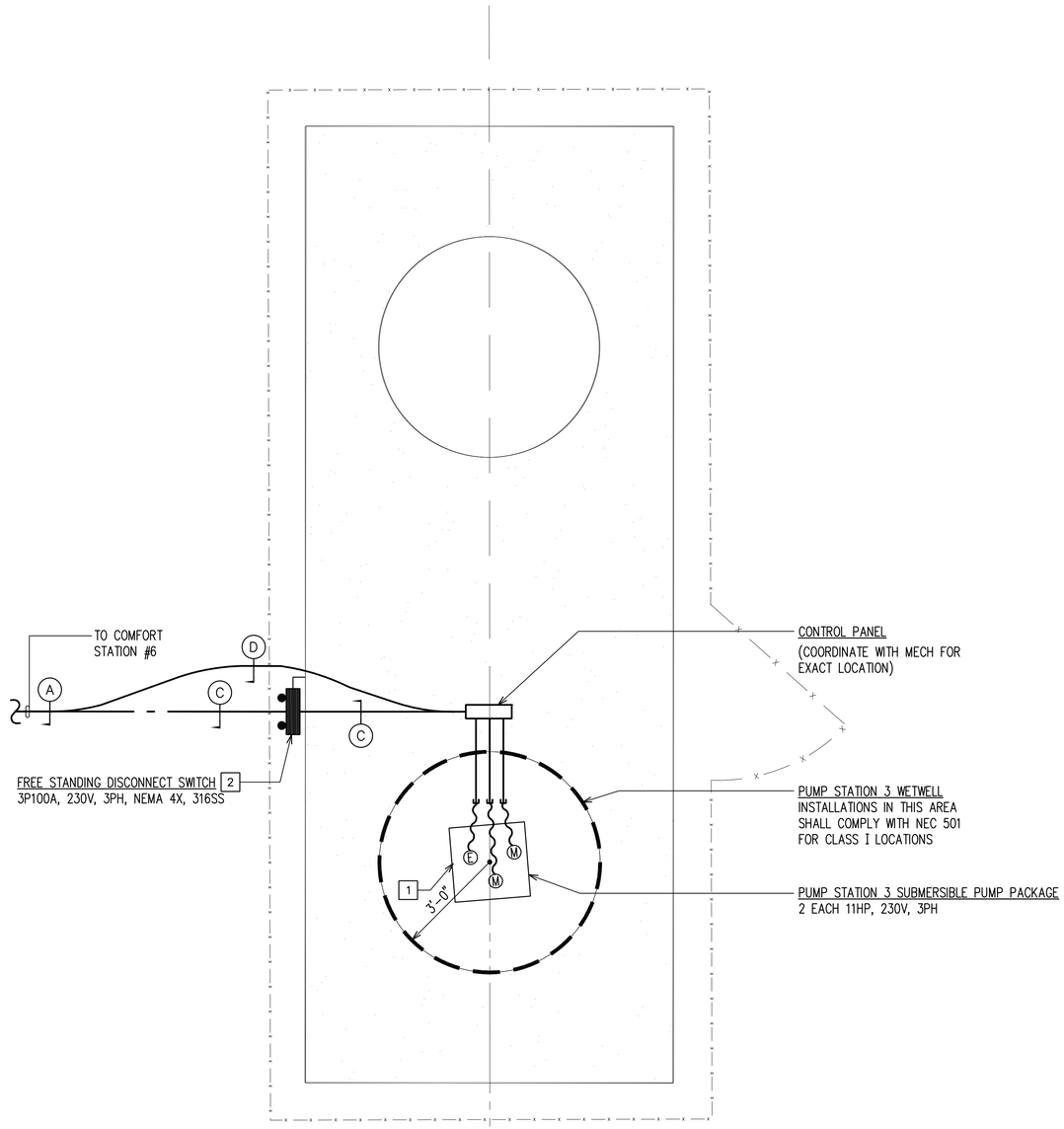
1. PROVIDE CONDUIT SEAL FITTING WITH APPROVED SEALING COMPOUND, WHEN ENTERING WET WELL CLASS I, DIVISION I, PER NEC 501.15.
2. SEE SHEET E-8 FOR FREESTANDING RACK DETAILS.



NORTH

PUMP STATION #3 ELECTRICAL PLAN

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



NORTH

ENLARGED PLAN

SCALE: 1/2"=1'-0"

2' 1' 0 2' 4' 6'
SCALE: 1/2"=1'-0"

8' 4' 0 8' 16' 24'
SCALE: 1/8"=1'-0"

GRAPHIC SCALES

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

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SIGNATURE 2021.02.01 APRIL 30, 2022 LIC. EXP. DATE

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Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

PUMP STATION #3
ELECTRICAL PLAN

DESIGNED: KU	SUBMITTED:
DRAWN: CAD	DATE:
CHECKED: SJI	SCALE: SCALE AS NOTED

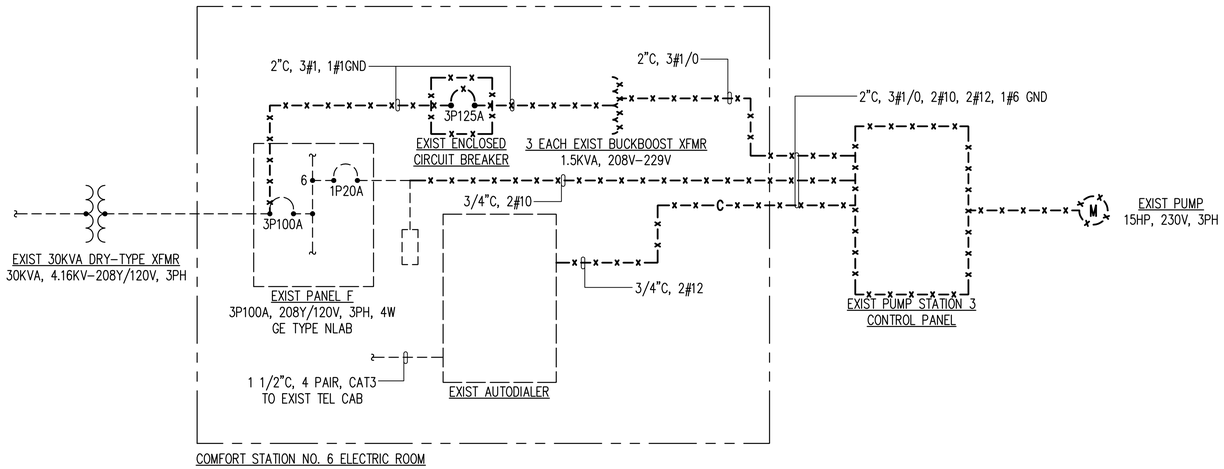
APPROVED: Carty Chang
E-signed 2021-02-03 09:39AM HST
carty.s.chang@hawaii.gov
State of Hawaii
Chief Engineer

DRAWING NO. E-7

JOB NO. F70C616E

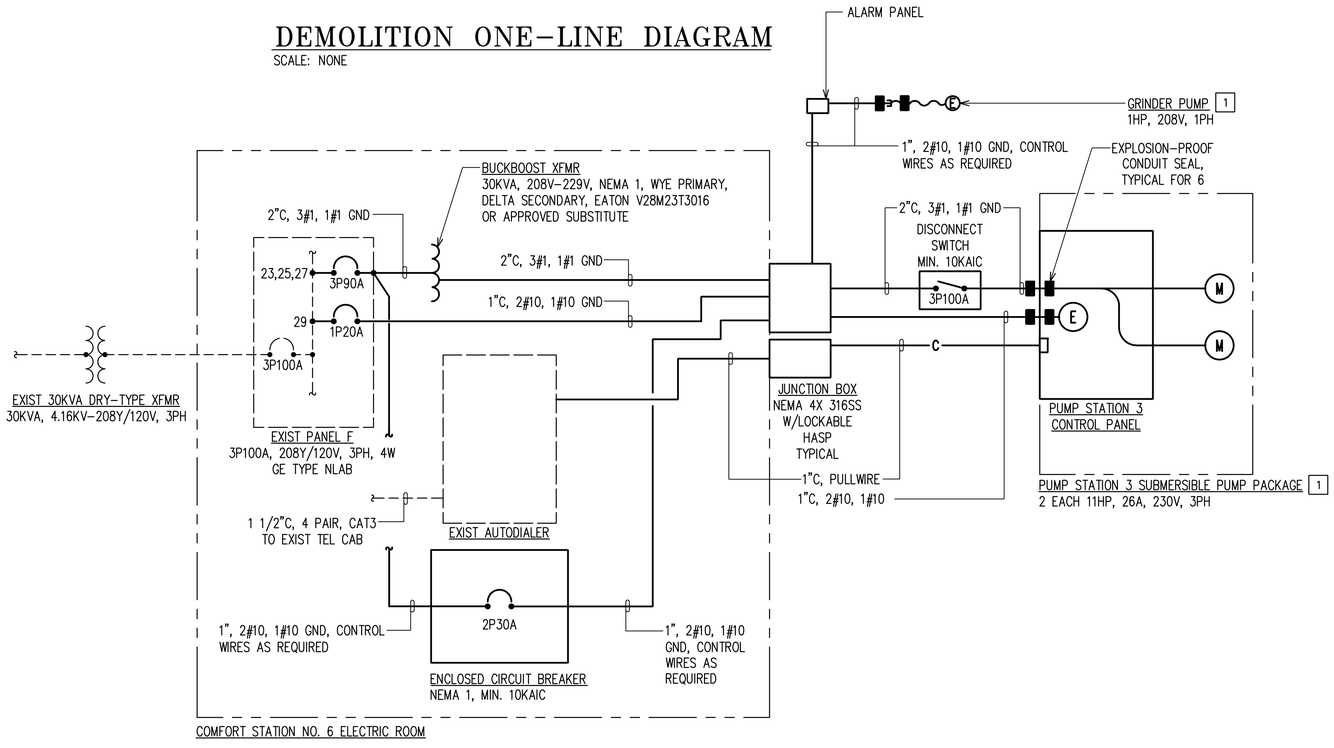
SHEET NO. 29 OF 30 SHEETS

2021-01-31 5:04 PM Z:\CAD\PROJECTS\219195\E-7_219195_Pump Sta Elec Plan



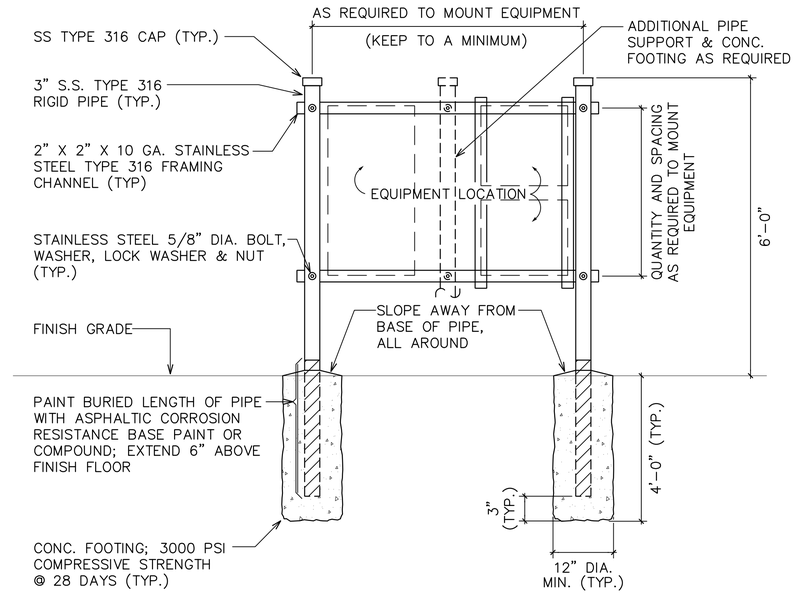
DEMOLITION ONE–LINE DIAGRAM

SCALE: NONE



NEW ONE–LINE DIAGRAM

SCALE: NONE



NOTE(S):

1. MAXIMUM 3' POST SPACING.

FREESTANDING EQUIPMENT RACK DETAIL

NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

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Department of Land and Natural Resources
SAND ISLAND STATE RECREATION AREA SEWER SYSTEM IMPROV
PHASE 2: PS 3 RELOCATION & FM 3 REPLACEMENT
Sand Island, Honolulu, Oahu, Hawaii

DEMOLITION AND NEW ONE–LINE DIAGRAMS

DESIGNED: KU	SUBMITTED:
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CHECKED: SJI	SCALE: SCALE AS NOTED
APPROVED: Carty Chang E-signed 2021-02-03 09:39AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO. E–8

JOB NO. F70C616E SHEET NO. 30 OF 30 SHEETS

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