

GENERAL NOTES

SYSTEMS RECEIVING WATER FROM THE CRESTVIEW SUBDIVISION MAINS SHALL BE TERMED "HIGH PRESSURE SYSTEM" IN THESE PLANS. SYSTEM RECEIVING WATER FROM THE WAIPAHU TRIANGLE MAINS SHALL BE TERMED "LOW PRESSURE SYSTEM".

PIPING AND ELECTRICAL CONDUITS AND WIRING ATTACHED TO BRIDGE STRUCTURES SHALL BE PLACED ON THE SIDE OF THE STRUCTURAL COMPONENTS AWAY FROM THE DIRECTION OF APPROACHING TRAFFIC. IN CASES WHERE TRAFFIC APPROACHES FROM BOTH SIDES, PIPING AND CONDUITS SHALL BE PLACED BETWEEN STRUCTURAL COMPONENTS SUCH AS GIRDERS AND/OR COLUMNS.

ALL PIPING ATTACHED TO BRIDGE STRUCTURES AND EXPOSED TO THE WEATHER SHALL BE OF DUCTILE IRON PIPE. IN ADDITION, THIS PIPING SHALL BE PAINTED TO MATCH THE COLOR OF THE STRUCTURE TO WHICH IT IS ATTACHED. ALL ELECTRICAL CONDUITS SHALL BE SIMILARLY PAINTED.

EARTH SLOPES AND OTHER AREAS EXPOSED BY GRADING SHALL BE PLANTED WITH GRASS OR SUITABLE GROUND COVER AS SOON AS PRACTICAL FOLLOWING COMPLETION OF GRADING OPERATIONS IN ACCORDANCE WITH LANDSCAPING REQUIREMENTS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE TO CHAPTER 37 & 37A OF THE PUBLIC HEALTH REGULATIONS, DEPARTMENT OF HEALTH, STATE OF HAWAII.

ALL EXCAVATION IN AREAS PREVIOUSLY PLANTED WITH VEGETATION SHALL BE RETURNED TO ITS ORIGINAL STATE BY THE CONTRACTOR, EITHER BY REPLANTING OR SODDING. THE CONTRACTOR SHALL REMAIN RESPONSIBLE FOR THE RESTORATION AND ANY ASSOCIATED DAMAGE, UNTIL SUCH TIME THAT THE PLANTING HAS RETURNED TO ITS ORIGINAL STATE, AS DETERMINED BY THE STATE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGES, INJURIES, DEATHS, ETC., RESULTING FROM ACCIDENTS TO PROPERTY, PERSONNEL, EXISTING UTILITIES, FACILITIES, AND APPURTENANCES. HE SHALL HOLD HARMLESS THE STATE OF HAWAII, THE UNITED STATES GOVERNMENT, THE ENGINEER, AND ALL THEIR EMPLOYEES FROM SUITS, DAMAGES RESULTING THEREFROM.

UTILITIES SHOWN ON THE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY, AND NO GUARANTEES ARE MADE AS TO THE ACCURACY OF THEIR LOCATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE APPROPRIATE COMPANIES OR AGENCIES OF THE GOVERNMENT TO VERIFY THE LOCATIONS OF THE UTILITIES IN THE FIELD. THE CONTRACTOR SHALL MAINTAIN COORDINATION WITH THE UTILITY COMPANIES AND/OR AGENCIES THROUGHOUT THE DURATION OF THE PROJECT TO SEE THAT NONE OF THE UTILITIES PASSING THROUGH OR ADJACENT TO THE PROJECT SITE ARE INTERFERED WITH OR DAMAGED IN ANY WAY.

THE CONTRACTOR SHALL VERIFY ALL LINES, GRADES, AND DIMENSIONS ON THE JOB AND TO COORDINATE ALL WORK WITH TRADES AND UTILITIES.

THE CONTRACTOR SHALL SECURE PERMISSION AND CLEARANCES FROM ALL GOVERNMENTAL AND/OR PRIVATE AGENCIES OR COMPANIES CONCERNED WITH THE WORK. HE SHALL SECURE AND PAY FOR ALL FEES AND PERMITS REQUIRED FOR THE CONSTRUCTION ON THIS PROJECT.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO AFFORD COMPLETE AND ADEQUATE PROTECTION AND SAFETY FOR HIS WORKING PERSONNEL AND THE PUBLIC AT ALL TIMES DURING THE CONSTRUCTION PERIOD.

THE CONTRACTOR SHALL DEWATER ALL TRENCHES AS REQUIRED FOR INSTALLATION AND TESTING OF PIPELINES AND FACILITIES.

THE CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER CONTRACTORS.

THE CONTRACTOR SHALL VERIFY SIZE AND LOCATION OF SLOTS, ANCHORS, OPENINGS, ETC., RELATING MECHANICAL, ELECTRICAL, AND ARCHITECTURAL WORK BEFORE POURING CONCRETE.

IN THE DIRECTION OF FLOW ALONG ANY LINE, DIAMETRIC PIPE SIZE SHALL REMAIN THE SAME OR SHALL DECREASE, AS SHOWN ON THE PLANS. UNLESS SPECIFICALLY CALLED FOR, IN NO CASE SHALL A PIPE OF ONE DIAMETER PRECEDE A PIPE OF A LARGER DIAMETER.

PRESSURE REDUCING VALVES SHALL BE SET AT PRESSURES INDICATED ON THE PLANS. ADJUSTMENTS TO THE INDICATED PRESSURES SHALL BE DONE UNDER DYNAMIC CONDITIONS, AS SHALL THE SETTING OF THE INDICATED PRESSURE BE DONE.

SCHEDULE 40 PVC PIPE WITH SOLVENT WELD CONNECTIONS SHALL BE USED UNLESS OTHERWISE CALLED FOR. SCHEDULE 40 PVC PIPE SHALL NOT BE THREADED. WHERE THREADED CONNECTIONS ARE REQUIRED, SCHEDULE 80 PIPE OR A THREADED ADAPTER SHALL BE USED, AT THE CONTRACTOR'S OPTION. SOLVENT WELD CONNECTIONS SHALL BE MADE ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

MINIMUM TRENCH SIZES FOR PIPING SHALL BE AS FOLLOWS:

PIPE SIZE	TRENCH WIDTH	TRENCH DEPTH
3" & LESS	1'-0"	1'-6" @
4"	2'-0"	2'-10"
6"	2'-0"	3'-7"

ALL SPRINKLER HEADS SHALL BE INSTALLED TRUE AND PLUMB, AND SHALL NOT BE INSTALLED PERPENDICULAR TO THE FINISHED GRADE EXCEPT IN THE CASE WHERE THE GRADE IS DEAD LEVEL OR UNLESS OTHERWISE CALLED FOR IN THE PLANS.

ANY SPRINKLER HEAD SELECTED BY THE CONTRACTOR HAVING A VARIABLE FLOW ADJUSTMENT FEATURE SHALL BE ADJUSTED UNDER DYNAMIC CONDITIONS.

ALL PIPING DESIGNS ARE BASED ON THE HAZEN-WILLIAMS FORMULA:

$$v = 1.318 C_r^{.63} s^{-.54}$$

HAZEN-WILLIAMS COEFFICIENT USED: FOR PVC PIPE  $C = 140$

ALL COST INCURRED FOR CONNECTIONS TO THE EXISTING WATER MAIN AND INSTALLATION OF WATER METERS SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS CONTRACT ITEMS.

REMOVAL OF EXISTING TREES SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS TREE PLANTING.

CHLORINATION SHALL BE PERFORMED ON THE 6-INCH WATER MAIN BETWEEN THE CONNECTION OF THE BWS LINE AND BACKFLOW PREVENTER. THIS COST SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE CONSIDERED INCIDENTAL TO THE 6-INCH WATER MAIN.

4000 P.S.F. SOIL BEARING PRESSURE ASSUMED. IF CONDITIONS INDICATE OTHERWISE, OR REQUIRE MODIFICATION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.

ALL CONCRETE MASONRY UNIT (CMU) WALLS SHALL BE VERTICALLY REINFORCED WITH 2-#4 BARS, 4'-0" ON CENTERS, AND THE SAME AT ALL CORNERS, ENDS, AND OPENINGS UNLESS OTHERWISE SHOWN. FILL CELLS CONTAINING REINFORCEMENT WITH CONCRETE GROUT. CONCRETE MASONRY UNIT HORIZONTAL REINFORCEMENT SHALL BE INSTALLED CONTINUOUSLY EVERY OTHER COURSE.

SLEEVES THROUGH STRUCTURAL MEMBERS SHALL NOT BE INSTALLED BY THE CONTRACTOR WITHOUT WRITTEN APPROVAL OF THE ENGINEER.

ALL CONCRETE USED ON THIS PROJECT SHALL BE CLASS B STRENGTH.

FOR PIPELINES THAT CROSS EXISTING PAVED ROADWAY, WORK SHALL BE PERFORMED AS FOLLOWS:

A. A.C. PAVEMENT SHALL BE NEATLY CUT.

B. TRENCH BACKFILL MATERIAL AND A.C. PAVEMENT SHALL MATCH THE EXISTING PAVEMENT STRUCTURE.

MINIMUM REINFORCING BAR COVERAGE: 3" ON BOTTOM AND SIDES OF FOOTINGS; 1-1/2" ON COLUMNS AND WALLS; 3/4" ON BEAMS.

ALL FOOTINGS SHALL EXTEND 6" INTO ORIGINAL UNDISTURBED EARTH. UNDER NO CIRCUMSTANCES SHALL ANY FOOTING BE PLACED ON FILL MATERIAL.

ALL CONCRETE USED ON THIS PROJECT SHALL BE POURED MONOLITHICALLY.

ALL REINFORCING BARS SHALL BE SECURELY TIED AND HELD IN PLACE TO PREVENT ANY MOVEMENT OR DISPLACEMENT WHILE CONCRETE IS BEING POURED.

ALL REINFORCEMENT SHALL BE PLACED TRUE AND PLUMB.

ALL ON-GRADE SLABS SHALL HAVE A MINIMUM REINFORCEMENT OF 6"x6" #10x#10 WELDED WIRE MESH.

THE CONTRACTOR SHALL NOTIFY CAHU SUGAR COMPANY, LTD, FORTY EIGHT HOURS PRIOR TO ENTERING THE WORK AREA.

THE HAUL CANE ROAD MUST BE OPENED FOR ALL HAUL CANE TRAFFIC DURING HARVESTING PERIODS AND FOR LIGHT TRAFFIC DURING ALL OTHER PERIODS.

ANY INTERFERENCE WITH OR DAMAGE TO PROPERTY UNDER CONTROL OF THE AIR FORCE SHALL BE PROMPTLY CORRECTED BY THE CONTRACTOR.

THE CONTRACTOR SHALL NOTIFY HAWAIIAN TELEPHONE COMPANY SEVENTY TWO HOURS IN ADVANCE OF ANY CONSTRUCTION SO THAT HAWAIIAN TELEPHONE COMPANY CAN "TONE" AND LOCATE THE TELEPHONE CABLE.

THE CONTRACTOR SHALL NOTIFY HAWAIIAN ELECTRIC COMPANY FIVE DAYS PRIOR TO ENTERING THE WORK AREA.

WATER NOTES

UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, DATED 1969, AS AMENDED, OF THE HAWAII HIGHWAYS DIVISION, DEPARTMENT OF TRANSPORTATION.

ASTERISK (\*) INDICATES WORK TO BE PERFORMED BY BOARD OF WATER SUPPLY. MATERIALS TO BE FURNISHED BY THE CONTRACTOR UNLESS SPECIFIED AS "RELOCATED".

THE CONTRACTOR SHALL NOTIFY THE BOARD OF WATER SUPPLY IN WRITING ONE WEEK PRIOR TO COMMENCING WORK ON THE MAIN.

APPROVAL BY THE BOARD OF WATER SUPPLY IS BASED SOLELY ON THE ADEQUACY OF THE WATER SUPPLY.

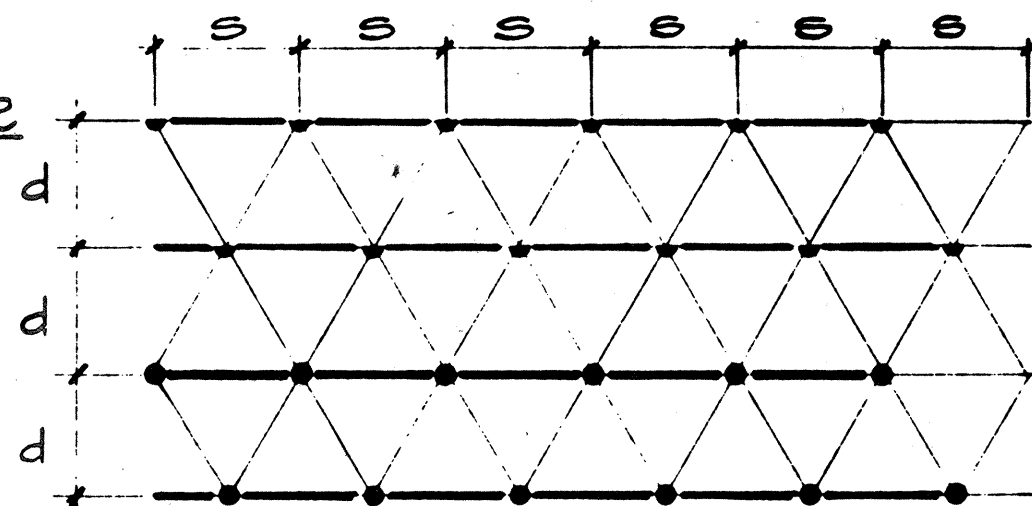
DISCREPANCIES, IF ANY, OF ALIGNMENTS, GRADES, FITTINGS, ETC. SHALL BE THE RESPONSIBILITY OF THE ENGINEER WHO PREPARED THE PLANS.

THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES AS SHOWN ON THE PLANS ARE FROM THE LATEST AVAILABLE DATA BUT IS NOT GUARANTEED AS TO THE ACCURACY OR THE ENCOUNTERING OF OTHER OBSTACLES DURING THE COURSE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGES TO EXISTING UTILITIES.

LEGEND

SYMBOL	DESCRIPTION
--- SCC	SIGNAL CORPS CABLE
--- HTC	HAWAIIAN TELEPHONE CABLE
--- HE	HAWAIIAN ELECTRIC CABLE
--- AG	AVIATION GAS LINE
— IF	ROAD BASE LINE (OR CONTROL LINE)
— W6	WATER MAIN (6 INCH)
⊗	GATE VALVE AUTOMATIC SPRINKLER CONTROL VALVE
⊗	VALVE IDENTIFIER
⊗	VALVE NUMBER
⊗	AREA
⊗	ZONE
⊗	PRESSURE REDUCING VALVE (PRV)
⊗	SIZE OF PRESSURE REDUCING VALVE
⊗	PRESSURE SETTING
⊗	VALVE OFFSET FROM ROAD BASE LINE
⊗	ROAD BASE LINE
⊗	STATION
⊗	OFFSET DISTANCE
⊗	VALVE
⊗	LINE IDENTIFIER
⊗	FULL CIRCLE SPRINKLER HEAD
⊗	HALF CIRCLE SPRINKLER HEAD
⊗	FOR UP FULL CIRCLE SPRINKLER HEAD
⊗	FOR UP HALF CIRCLE SPRINKLER HEAD
⊗	QUICK COUPLER
⊗	SIZE OF SPRINKLER IN BANK (RADIUS OF COVERAGE)
⊗	STRIP SPRAY HEAD
⊗	AIR RELIEF VALVES
⊗	DOUBLE CHECK BACKFLOW PREVENTER
⊗	6" GATE VALVE
→	DIRECTION OF FLOW

TYPICAL SPRINKLER LINE PATTERN



SPRINKLER SPACING SCHEDULE		
SPRINKLER RADIUS	SPACING	SPACING
10'	10'-0"	0'-8"
15'	10'-6"	10'-1"
25'	17'-6"	15'-2"
35'	24'-6"	21'-3"
50'	35'-0"	30'-4"

DATE	_____
SURVEY PLOTTED BY	_____
DRAWN BY	_____
DESIGNED BY	_____
QUANTITIES BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
No.	_____

APPROVED:  
*[Signature]*  
ASST. CHIEF ENGR - BWS

10-16-73  
DATE  
Addition of water notes  
REVISION

PHILIP K. H. YEE & ASSOCIATES  
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REGISTERED PROFESSIONAL ENGINEER  
No. 2624-E  
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME  
OR UNDER MY SUPERVISION.

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

WAIAWA INTERCHANGE

WATER SPRINKLER SYSTEM  
PROJ # 1-HI-1(102)-8

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