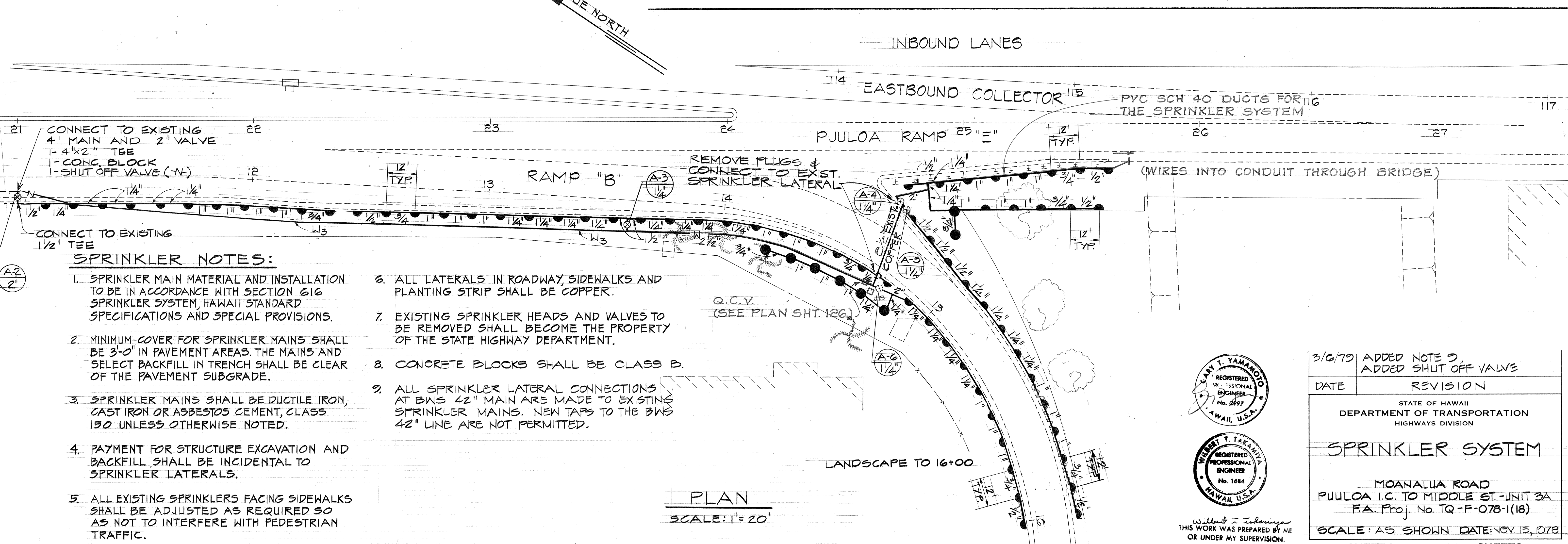
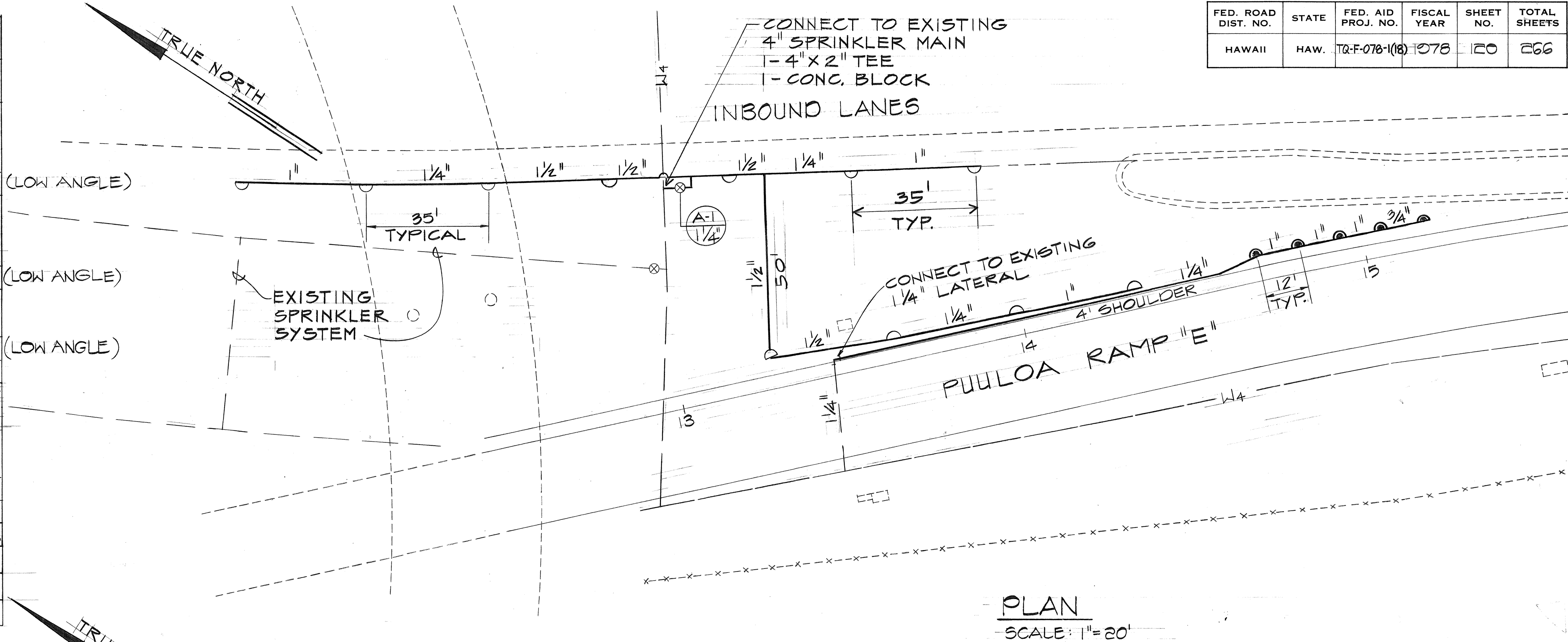


SPRINKLER LEGEND									
SPRINKLER	SYMBOL	DESCRIPTION	PRESSURE PSI	COVERAGE FEET	FLOW GMP	NOZZLE INCHES	RISER INCHES	SPECIAL FEATURES	
S-12	●	SHRUB SPRAY-FULL	20	12 RAD.	3.0		1/2	BRASS CONSTRUCTION	
S-12	▲	SHRUB SPRAY-HALF	20	12 RAD.	2.0		1/2		
S-12	▲	SHRUB SPRAY-QUAR	20	12 RAD.	1.2		1/2		
SS-18	●	STREAM SPRAY-FULL	20	14 RAD.	1.0		1/2	BRASS CONSTRUCTION	
I-35 F	○	IMPACT-FULL	35	37 RAD.	6.4	3/16	3/4	BRASS/BRONZE CONSTRUCTION	
I-35 P	△	IMPACT-PART	35	34 RAD.	3.6	9/64	1/2	W/ BRASS NOZZLE	
I-35 P	△	IMPACT-PART	35	34 RAD.	3.6	9/64	1/2	W/ BREAK-UP PIN	
SS-18	●	STREAM SPRAY-QUARER	20	14 RAD.	0.8		1/2	BRASS CONSTRUCTION	
P-12	●	POP-UP LAWN-HALF	20	12 RAD.	2.0		1/2	BRASS	
P-12	●	POP-UP LAWN-QUARTER	20	12 RAD.	1.2		1/2	CONSTRUCTION	
SS-18	●	STREAM SPRAY - FULL	20	14 RAD.	1.7		1/2	BRASS CONSTRUCTION	
	Ⓜ	STATION AUTOMATIC CONTROLLER					JOHNS - MANSVILLE KCS12		PEDESTAL MTD.
	Ⓜ	ELECTRIC REMOTE CONTROL VALVE					BUCKNER 930 SERIES		24 VOLT WATERPROOF SOLENOID INSTALL IN VALVE BOX W/COVER
	Ⓜ	QUICK COUPLING VALVE, ROYAL COACH 25007							
(A-2) 2"	⊗	VALVE STATION NUMBER & VALVE SIZE (IN INCHES)							
		LOW VOLTAGE CONTROL WIRES IN CONDUIT TO CONTROLLER							
	Ⓜ	DOUBLE CHECK BACKFLOW PREVENTER					FEBCO - 805		
Ⓜ	◆	VALVE ASSEMBLY UNIT FOR DRIP IRRIGATION					"SUBTERRAIN" PRV & "STRONG" Y-STRAINERS		
	Ⓜ	EMITTER (SINGLE) GLOBAL WATER STF							
	Ⓜ	EMITTERS (W/ AMOUNT REQUIRED PER TREE)							
	Ⓜ	JUNCTION BOX							

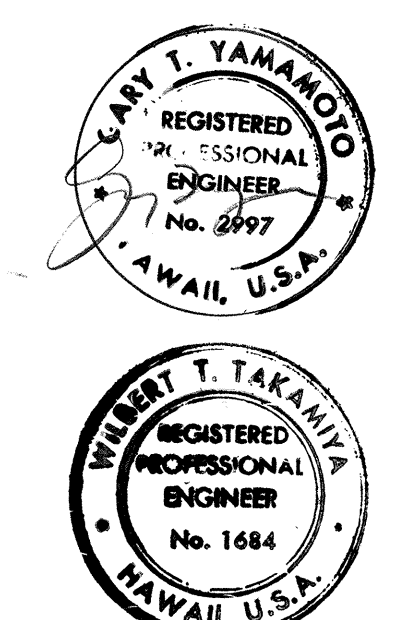
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	TQ-F-078-1(18)	1978	120	266



SPRINKLER NOTES:

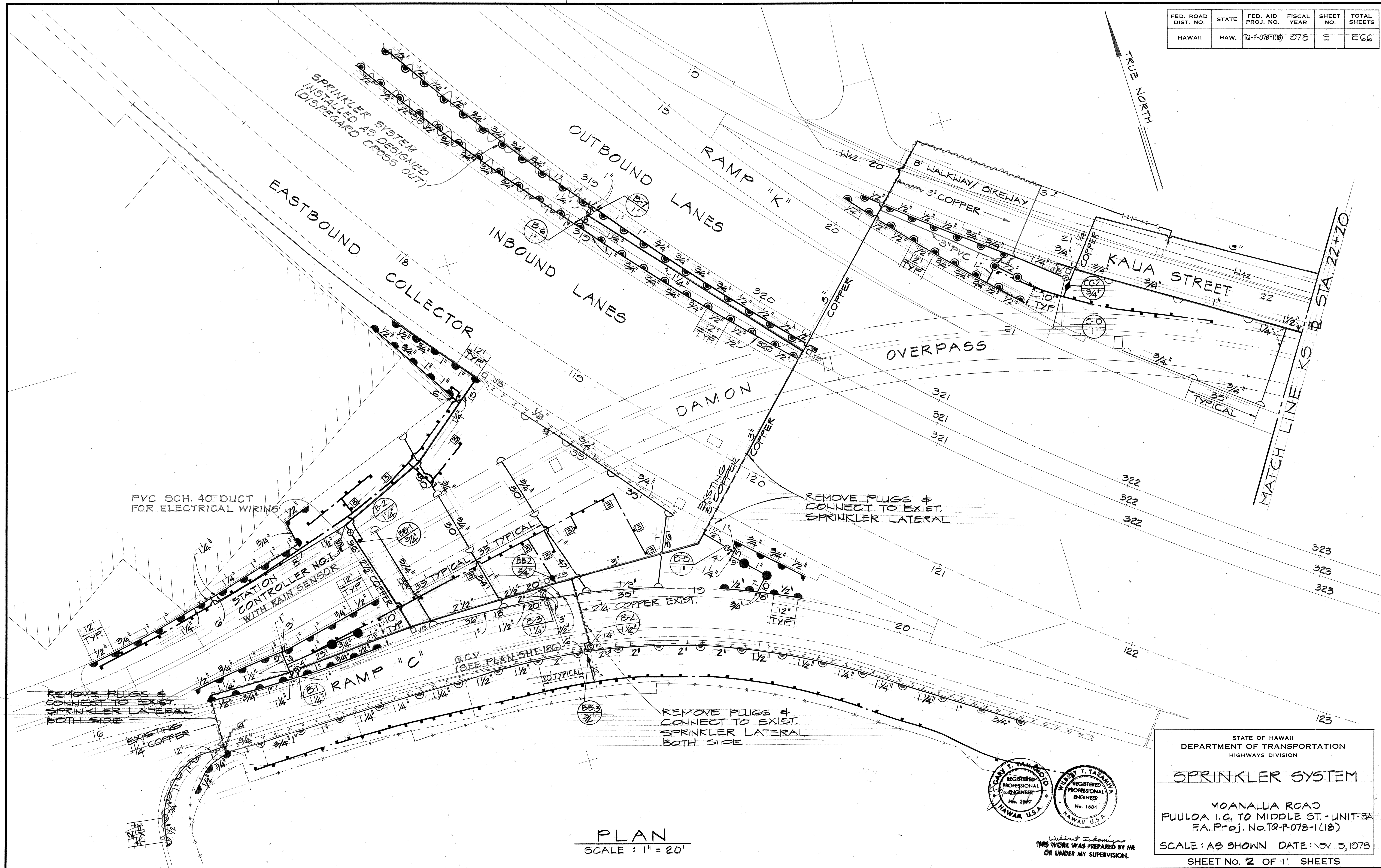
1. SPRINKLER MAIN MATERIAL AND INSTALLATION TO BE IN ACCORDANCE WITH SECTION 616 SPRINKLER SYSTEM, HAWAII STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.
2. MINIMUM COVER FOR SPRINKLER MAINS SHALL BE 3'-0" IN PAVEMENT AREAS. THE MAINS AND SELECT BACKFILL IN TRENCH SHALL BE CLEAR OF THE PAVEMENT SUBGRADE.
3. SPRINKLER MAINS SHALL BE DUCTILE IRON, CAST IRON OR ASBESTOS CEMENT, CLASS 150 UNLESS OTHERWISE NOTED.
4. PAYMENT FOR STRUCTURE EXCAVATION AND BACKFILL SHALL BE INCIDENTAL TO SPRINKLER LATERALS.
5. ALL EXISTING SPRINKLERS FACING SIDEWALKS SHALL BE ADJUSTED AS REQUIRED SO AS NOT TO INTERFERE WITH PEDESTRIAN TRAFFIC.
6. ALL LATERALS IN ROADWAY, SIDEWALKS AND PLANTING STRIP SHALL BE COPPER.
7. EXISTING SPRINKLER HEADS AND VALVES TO BE REMOVED SHALL BECOME THE PROPERTY OF THE STATE HIGHWAY DEPARTMENT.
8. CONCRETE BLOCKS SHALL BE CLASS B.
9. ALL SPRINKLER LATERAL CONNECTIONS AT BWS 42" MAIN ARE MADE TO EXISTING SPRINKLER MAINS. NEW TAPS TO THE BWS 42" LINE ARE NOT PERMITTED.

PLAN
SCALE: 1" = 20'

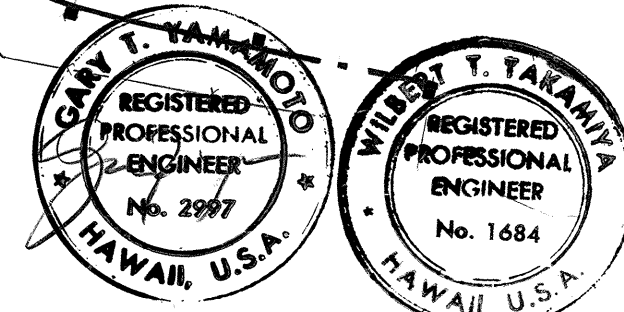


3/6/79	ADDED NOTE 9, ADDED SHUT OFF VALVE
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
SPRINKLER SYSTEM	
MOANALUA ROAD PUULOLO I.C. TO MIDDLE ST.-UNIT 3A F.A. Proj. No. TQ-F-078-1(18)	
SCALE: AS SHOWN DATE: NOV. 15, 1978	
SHEET NO. 1 OF 11 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	TQ-F-078-1(18)	1978	121	266



PLAN
SCALE: 1" = 20'



Without Testimony
THIS WORK WAS PREPARED BY ME
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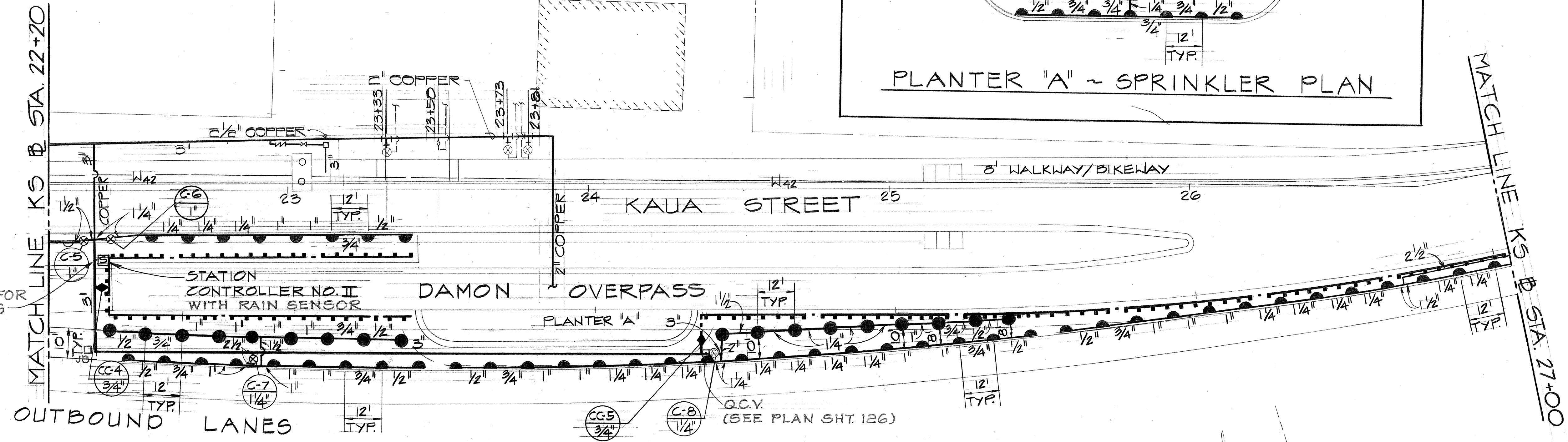
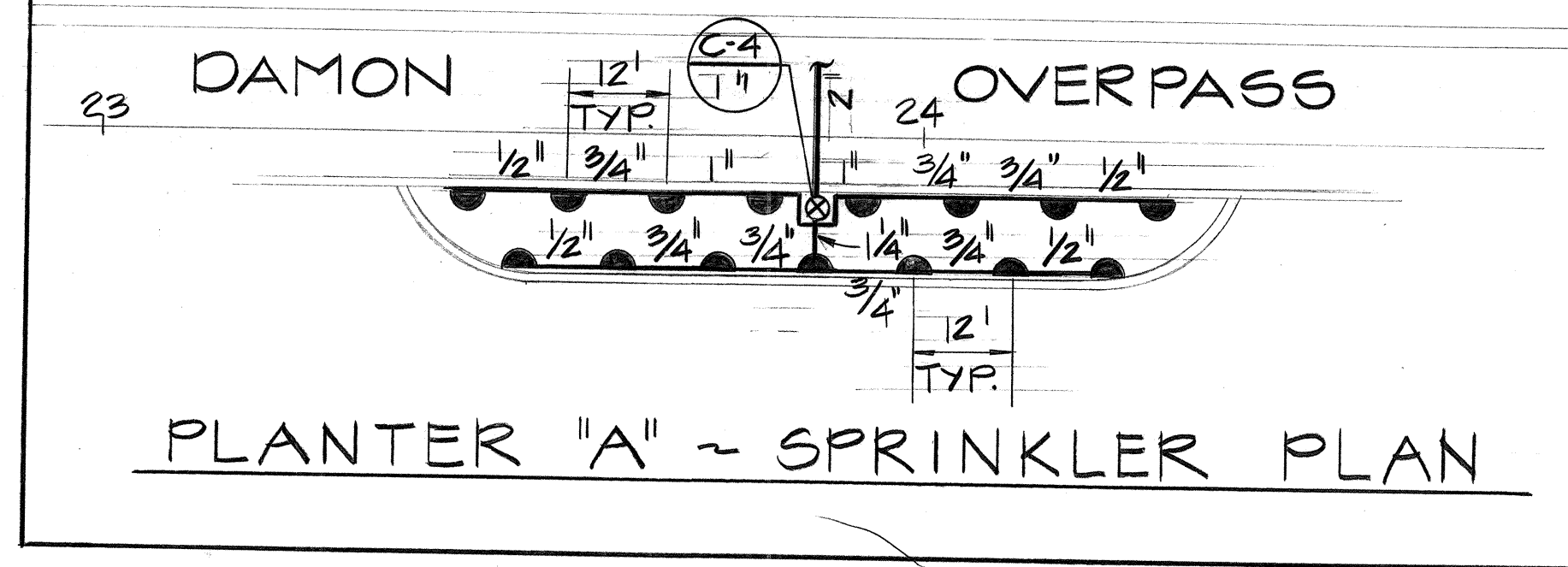
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPRINKLER SYSTEM

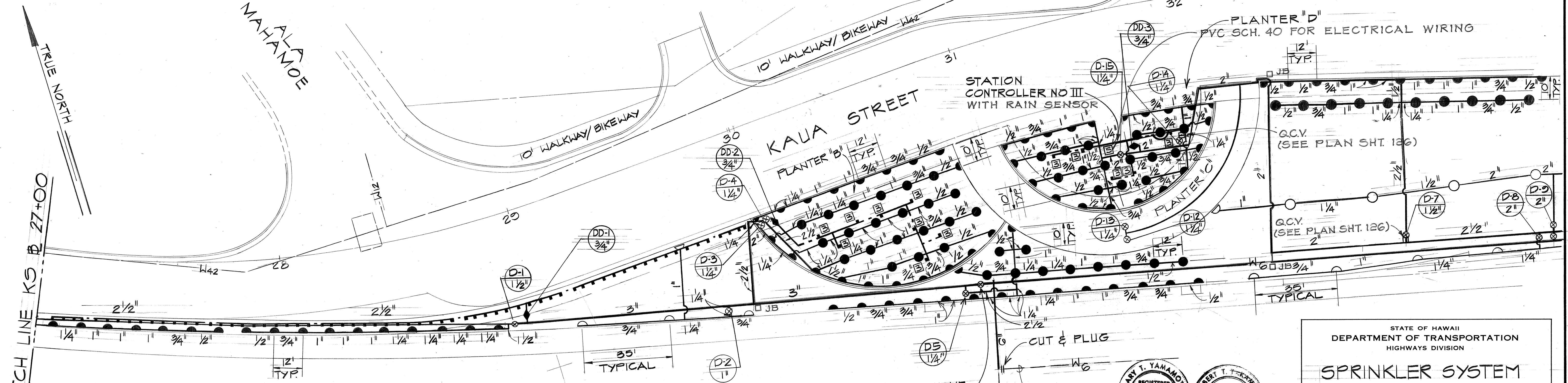
MOANALUA ROAD
PUULO A I.C. TO MIDDLE ST. - UNIT-3A
F.A. Proj. No. TQ-F-078-1(18)

SCALE: AS SHOWN DATE: NOV. 15, 1978
SHEET NO. 2 OF 11 SHEETS

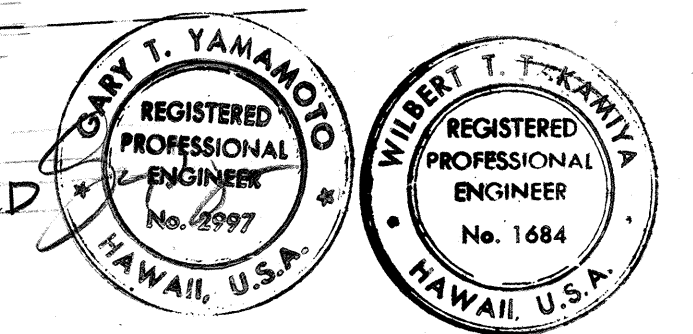
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	TQ-F-078-1(18)	078	122	266



PLAN
SCALE: 1" = 20'



PLAN
SCALE: 1" = 20'



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPRINKLER SYSTEM

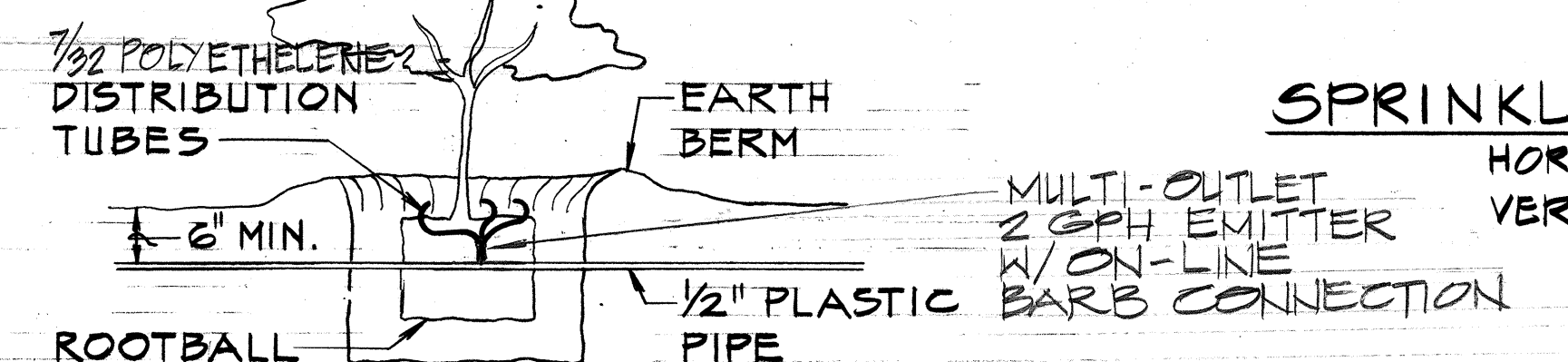
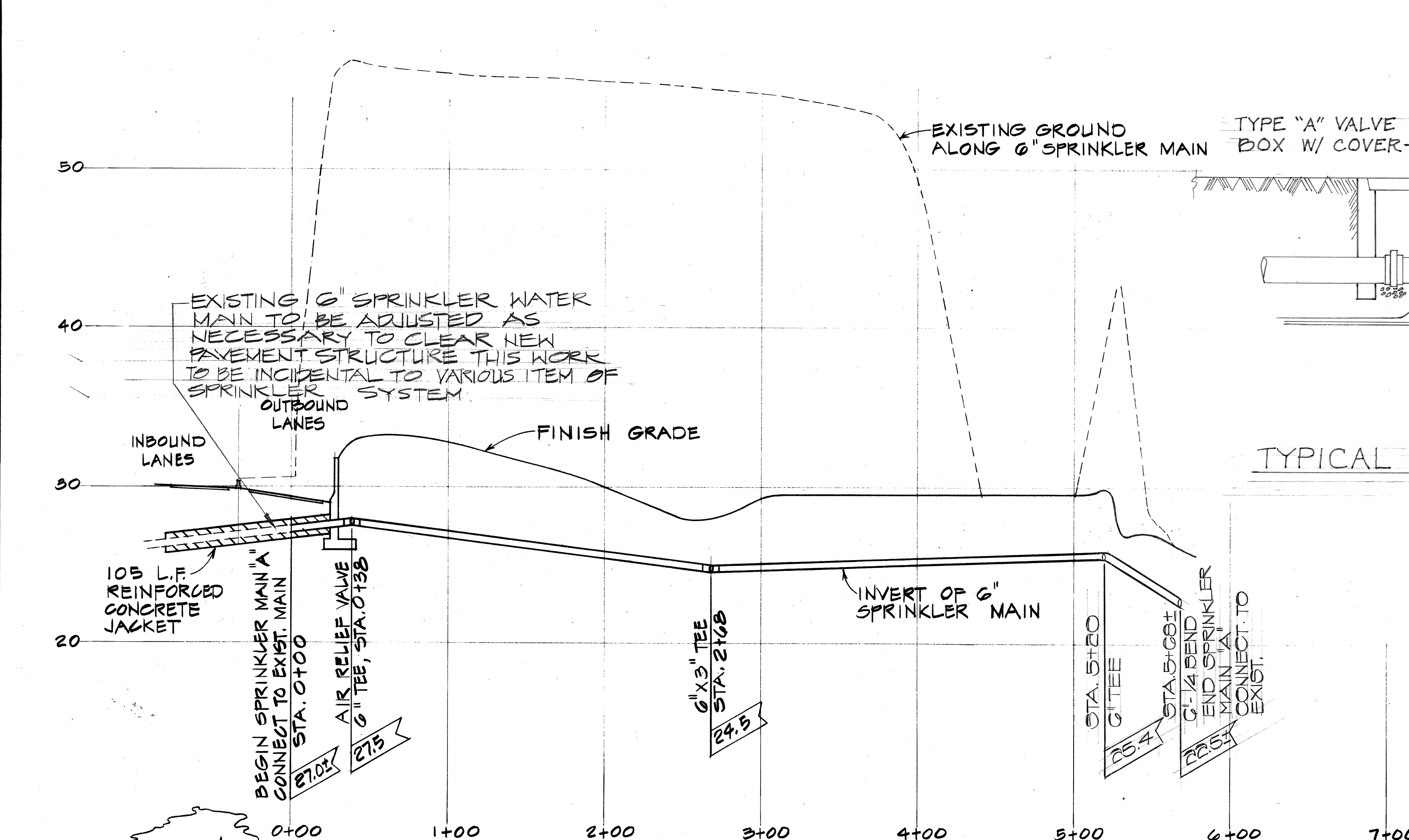
MOANALUA ROAD
PUULO A I.C. TO MIDDLE ST. - UNIT-3A
F.A. Proj. No. TQ-F-078-1(18)

SCALE: AS SHOWN DATE: NOV. 15, 1978

SHEET No. 3 OF 11 SHEETS

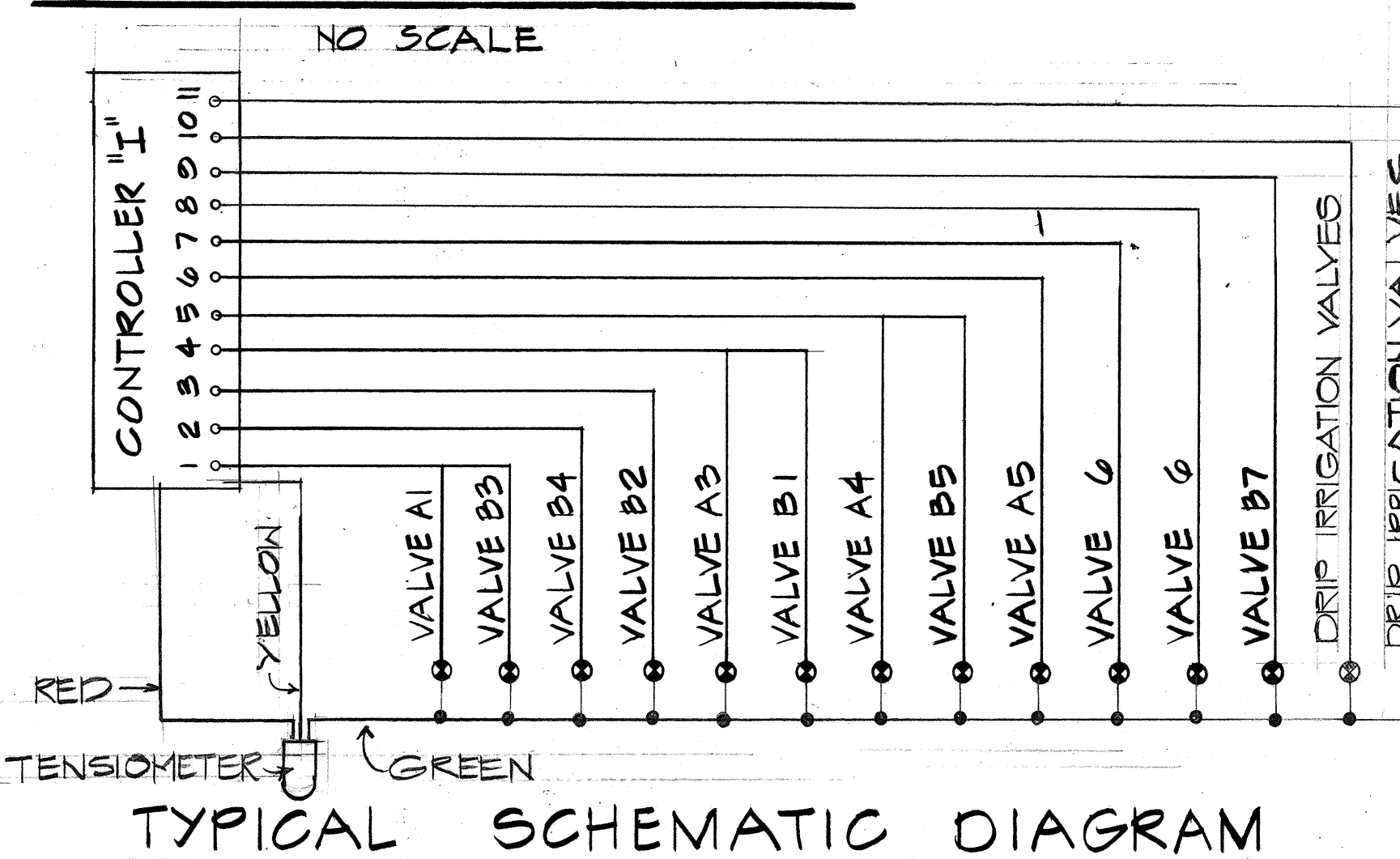
Willbert T. Kania
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SURVEY PLOTTED BY: _____ DATE: _____
DRAWN BY: _____
CHECKED BY: _____
NOTE BOOK NO. _____



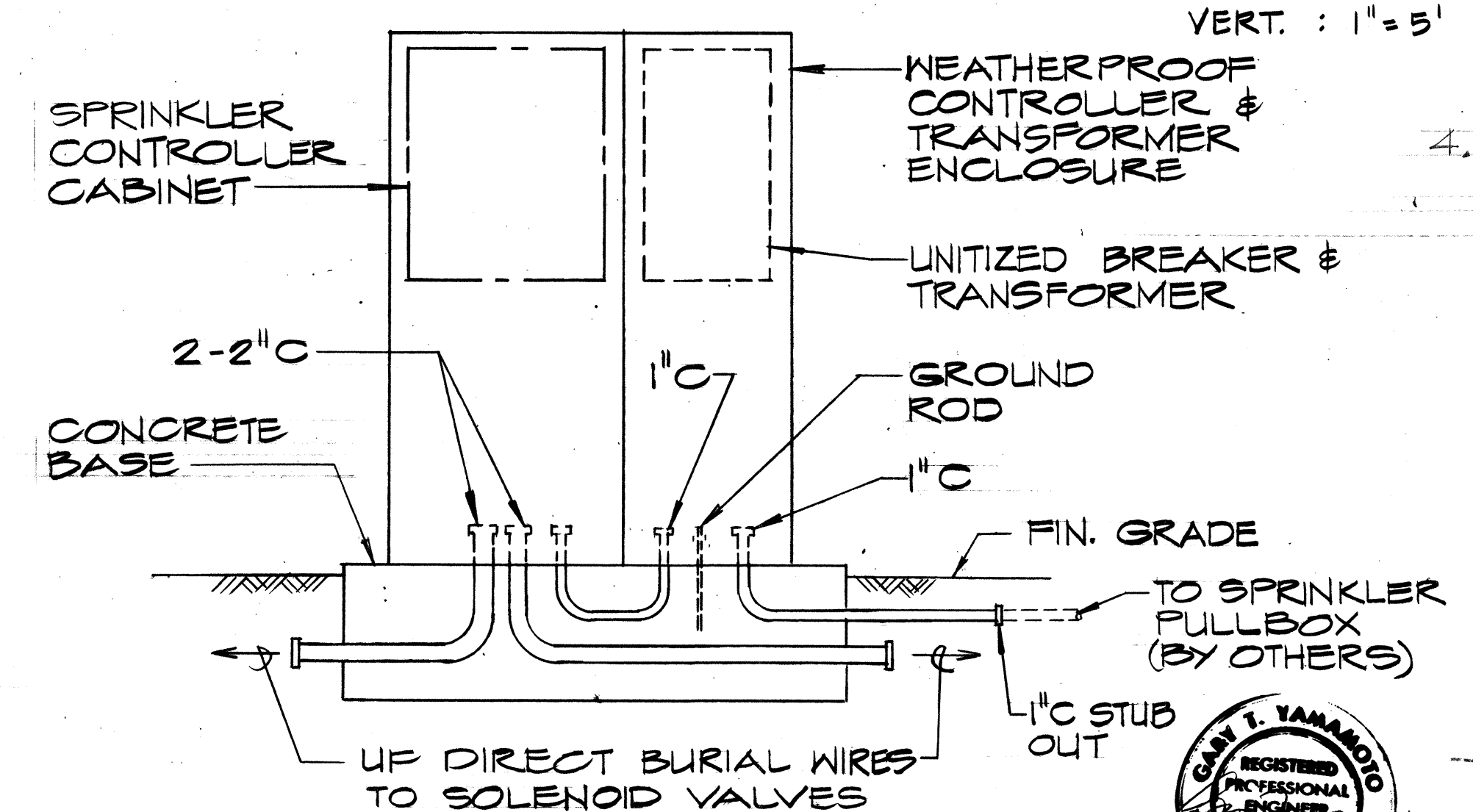
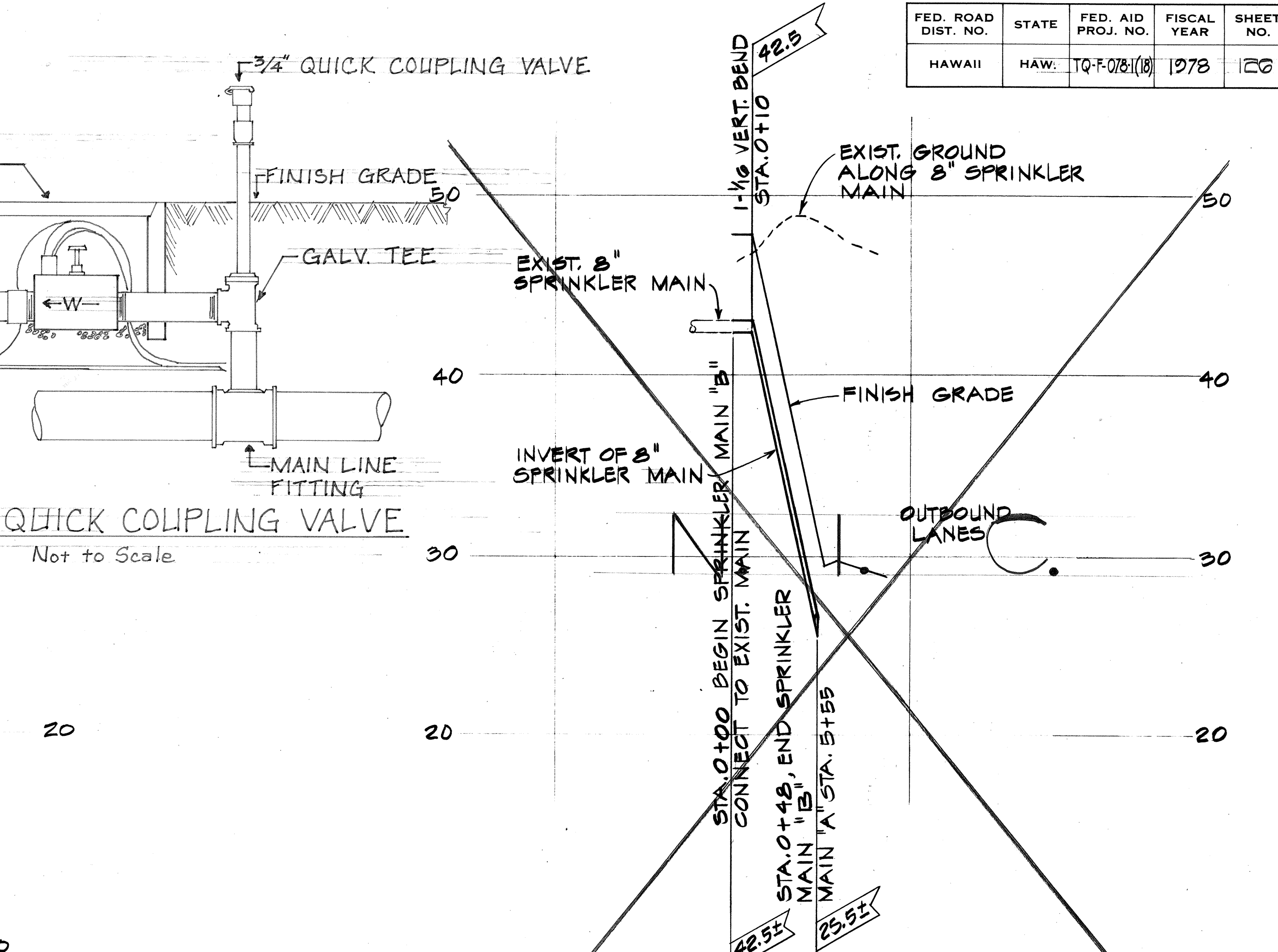
NOTES: 1. PROVIDE 3-EMISSION POINTS PER TREE @ 2 GPH.
2. LOCATE EMISSION POINTS ABOVE ROOTBALL, MINIMUM 2' FROM TREE TRUNK.

EMITTER LAYOUT DET.



NOTE: ALL WIRE ARE NO. 14 WIRES

OPERATING SCHEDULE											
CONTROLLER											
STA. NO.	VALVE NO.	OPER. TIME (MIN.)	VALVE NO.	OPER. TIME (MIN.)	VALVE NO.	OPER. TIME (MIN.)	VALVE NO.	OPER. TIME (MIN.)	VALVE NO.	OPER. TIME (MIN.)	VALVE NO.
1	A1, B3	30	C3	30	D2, D8	30	F3	28	H4	5	
2	B4	15	C5	25	D9	30	F6	28	G1	6	
3	B2	10	C1	10	D10	30	E1	25	G3	6	
4	A3, B1	5	C2	10	D6	7	F2	10	G4	6	
5	A4, B5	5	C8	10	D5, D7	6	E4	15	H2	5	
6	A5	5	C6	8	D12	6	F7	6	G2	5	
7	A6	5			D13	6	E2, F	1	H1	6	
8	B6	11	C7	6	D1, D11	6	E3, F	13	H3	7	
9	B7	11	C4	5	D3, D14	5	F8	5	H5	9	
10	B8-3	300	C10	11	D4, D15	5	F9	7	G5, H4	300	
11			CC-2	300	DD-THRU DD-3	300	F4	12			
12			CC-4, CC-5	300	DD-4, DD-5	300	EE-1, EE-2	300			



SPRINKLER CONTROLLER DETAIL

NOTES:
1. CONCRETE BASE TO BE SIZED ACCORDING TO MANUFACTURER'S RECOMMENDATION.
2. SEE SHEET 101 FOR ELECTRICAL DETAILS.
3. SPINKLER CONTROLLER SHALL HAVE LONG TIMING CAPABILITY FOR DRIP IRRIGATION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPRINKLER MAIN PROFILES

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3A
F.A. Proj. No. TQ-F-078-1(18)

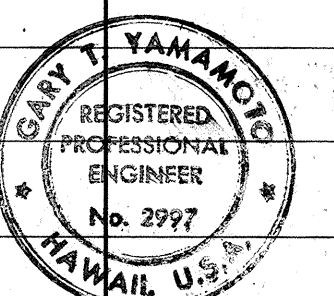
SCALE: AS SHOWN DATE: NOV. 15, 1978

SHEET NO. 7 OF 11 SHEETS

SPRINKLER SUMMARY

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	TQ-P-075-108	1978	127	266

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SYSTEM NO.	ITEM NO.	616	616	616	616		616	616		616	616	616	616	616			616	616	616	616	616	616	616	616	616	616	616	616	616	616	616	616	REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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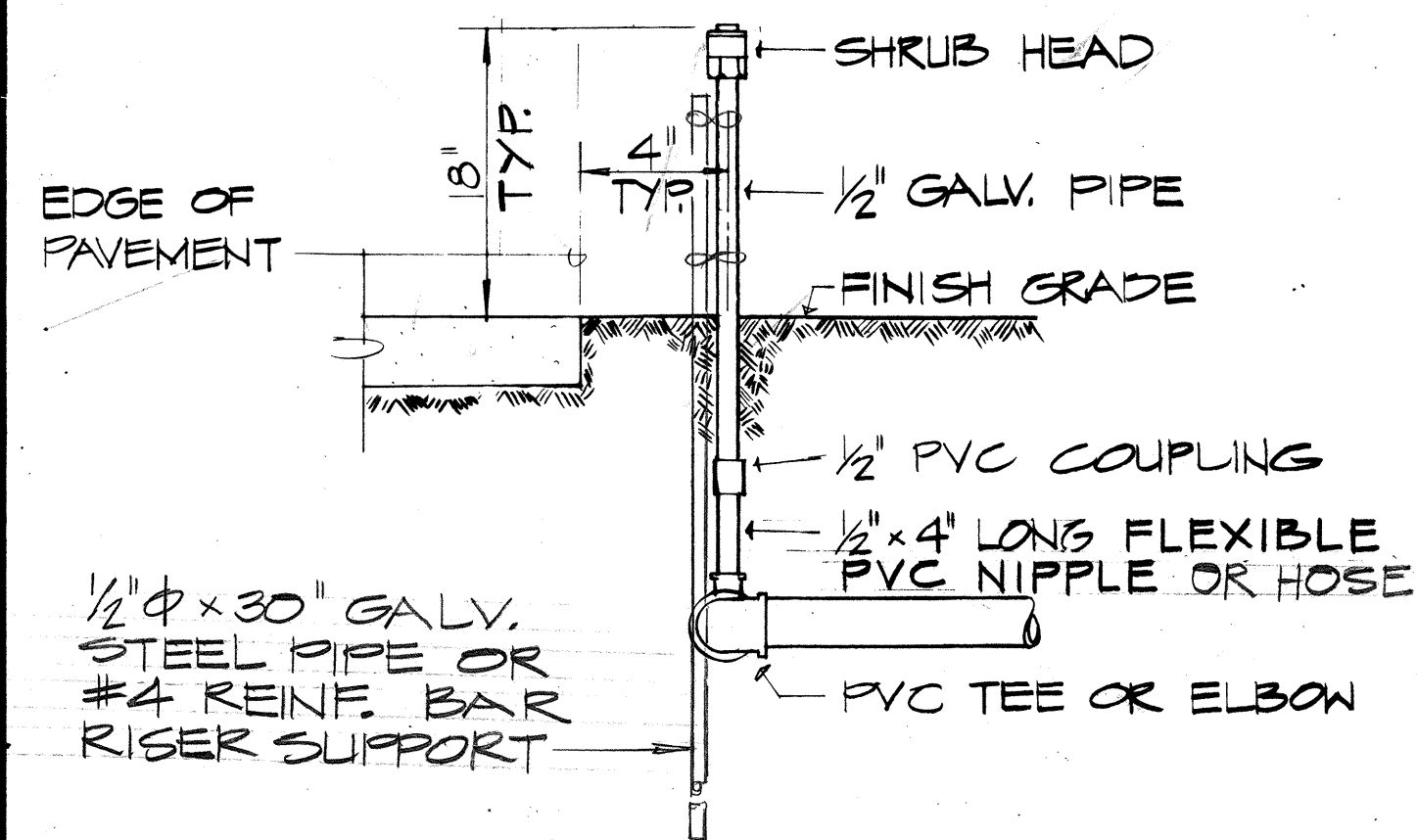
SUMMARY

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	79-F-078-18	078	128	266

[illegible]

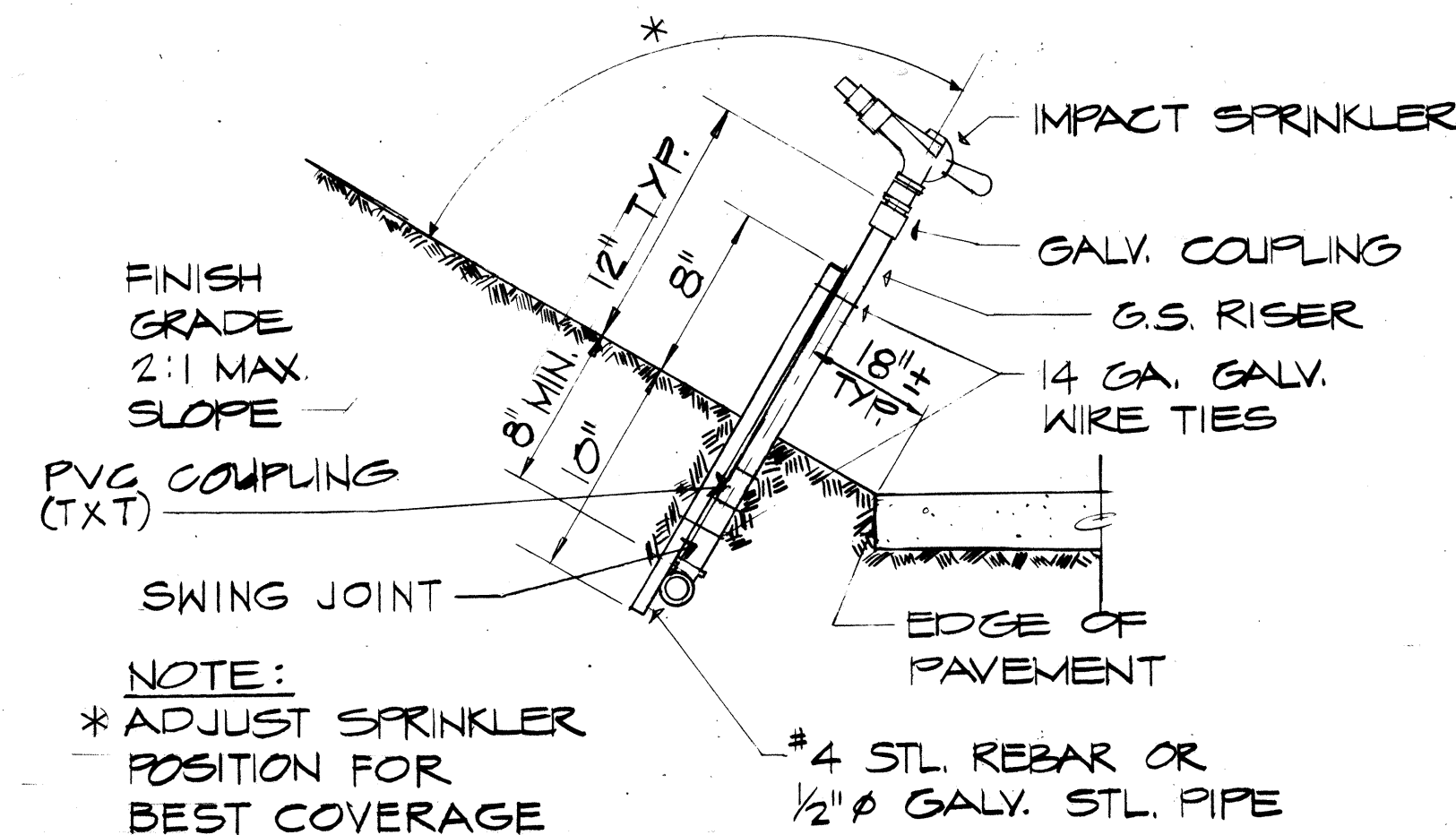
Gay Bryant
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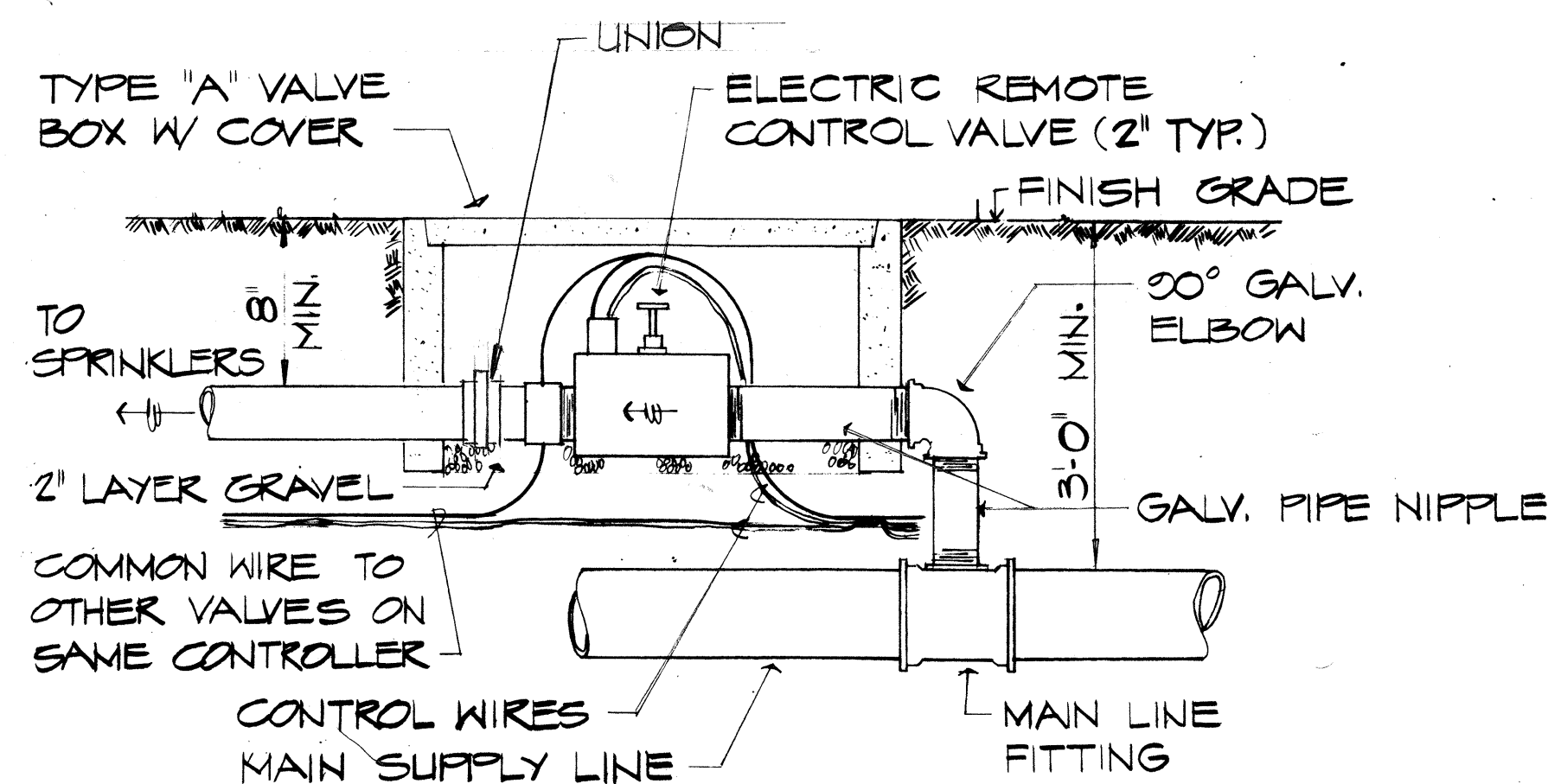
TYP. SHRUB HEAD DETAIL

NO SCALE



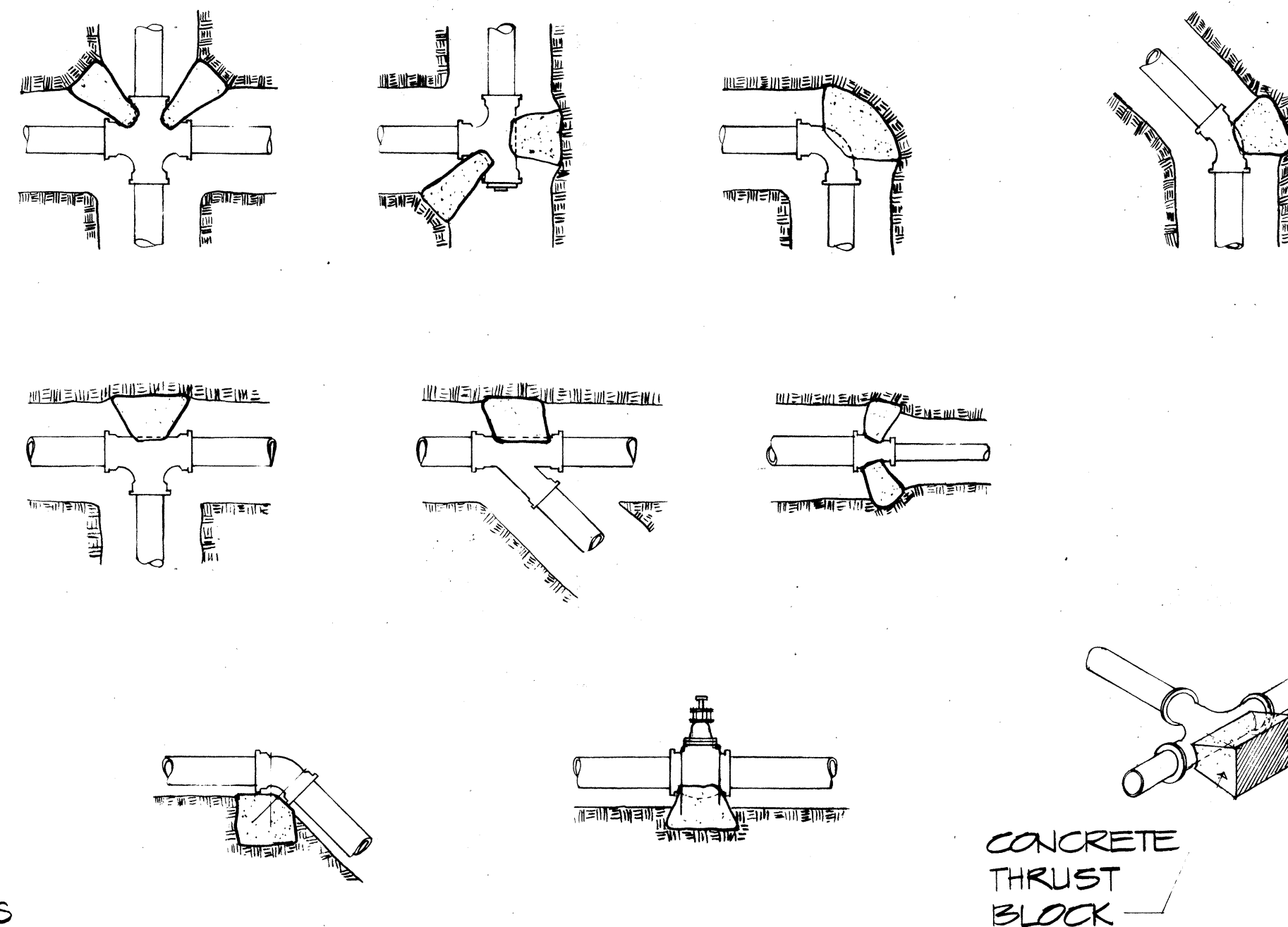
TYP. IMPACT HEAD DETAIL

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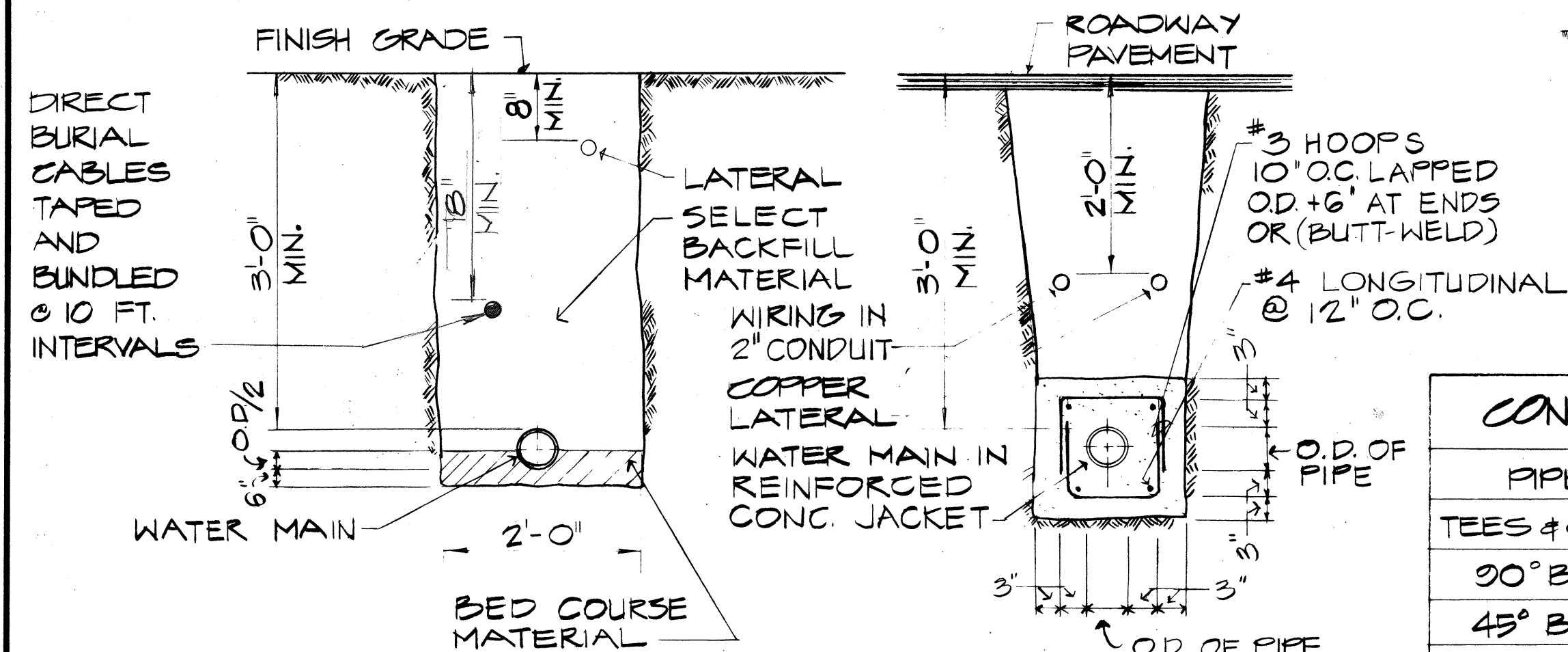
TYP. SOLENOID VALVE DETAIL

NO SCALE



CONC. THRUST BLOCK DETAILS

NO SCALE



TYPICAL TRENCHING DETAILS

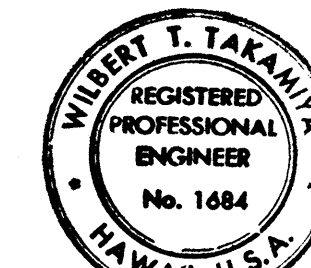
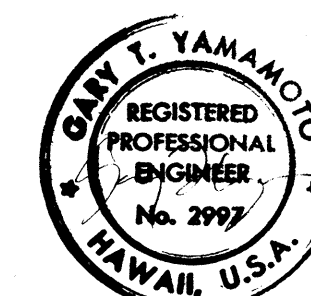
NO SCALE

CONCRETE THRUST BLOCK BEARING AREA (SQ. FT.)								
PIPE SIZES	6"	4"	2 1/2"	2"	1 1/2"	1 1/4"	1"	3"
TEES & CROSSES	3.00	1.25	0.50	0.50	0.50	0.50	—	1.00
90° BENDS	4.00	2.00	0.75	0.50	0.50	0.50	—	1.25
45° BENDS	2.25	1.00	0.50	0.50	0.50	0.50	—	0.75

NOTE: CONCRETE FOR THRUST BLOCKS SHALL BE INCIDENTAL TO VARIOUS CONTRACT ITEMS OF SPRINKLER SYSTEM

INSTALLATION NOTES:

1. ALL MAIN LINE TO BE INSTALLED AND TESTED ACCORDING TO MANUFACTURERS INSTALLATION GUIDE. EACH SHALL BE A PART OF THE INSTALLATION SPECIFICATIONS.
2. ALL TRENCH DEPTH AND WIDTH SHALL BE AS SHOWN ON THE IRRIGATION PLANS.
3. THE CONTRACTOR SHALL ARRANGE FOR THE SERVICE OF THE MANUFACTURERS QUALIFIED INSTRUCTOR.
4. CONCRETE FOR THRUST BLOCK AND REINFORCED CONCRETE JACKET SHALL BE CLASS "B"
5. CONDUIT FOR DIRECT BURIED CABLES SHALL BE INCIDENTAL TO SPRINKLER SYSTEM.



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

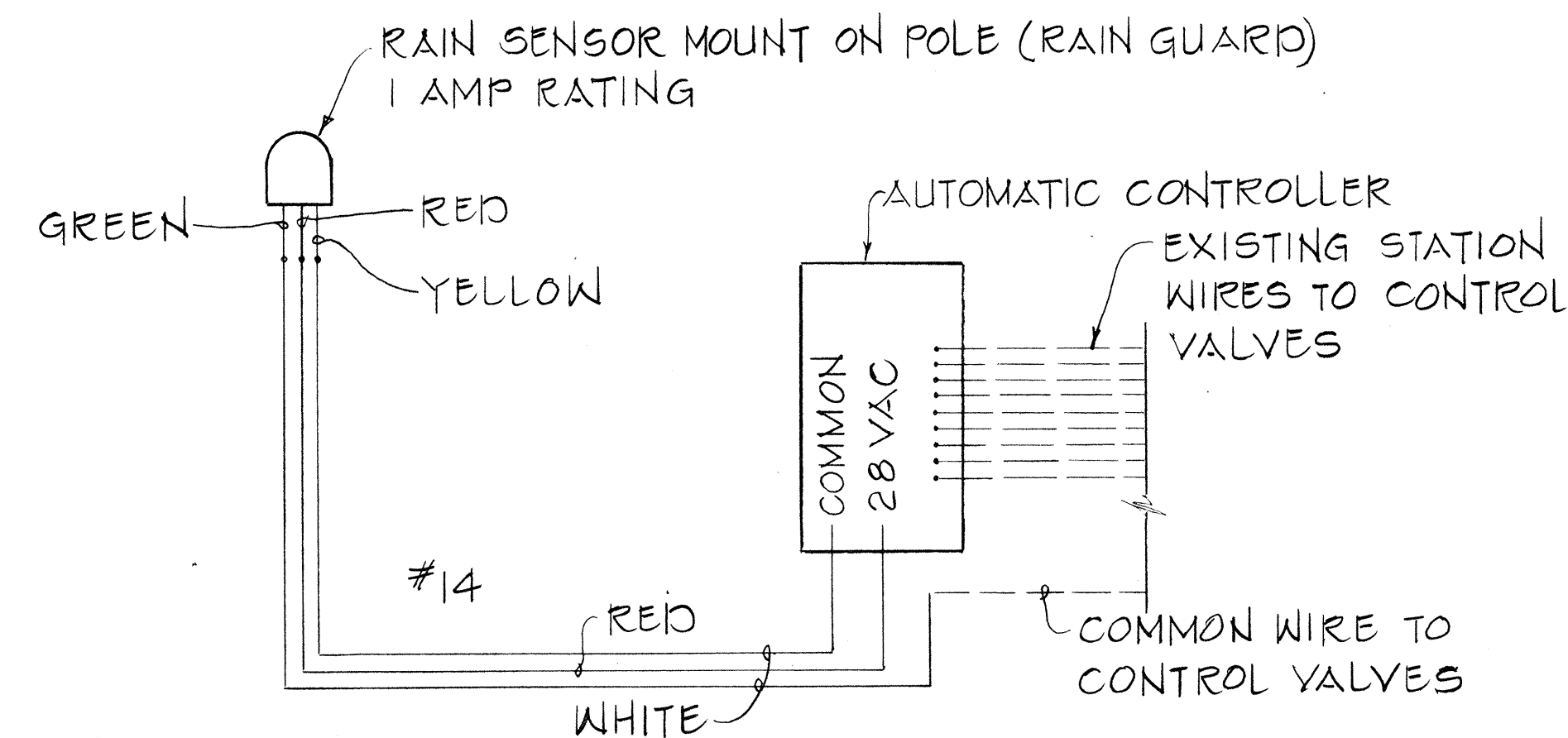
SPRINKLER DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3A
F.A. Proj. No. TQ-F-078-1(18)

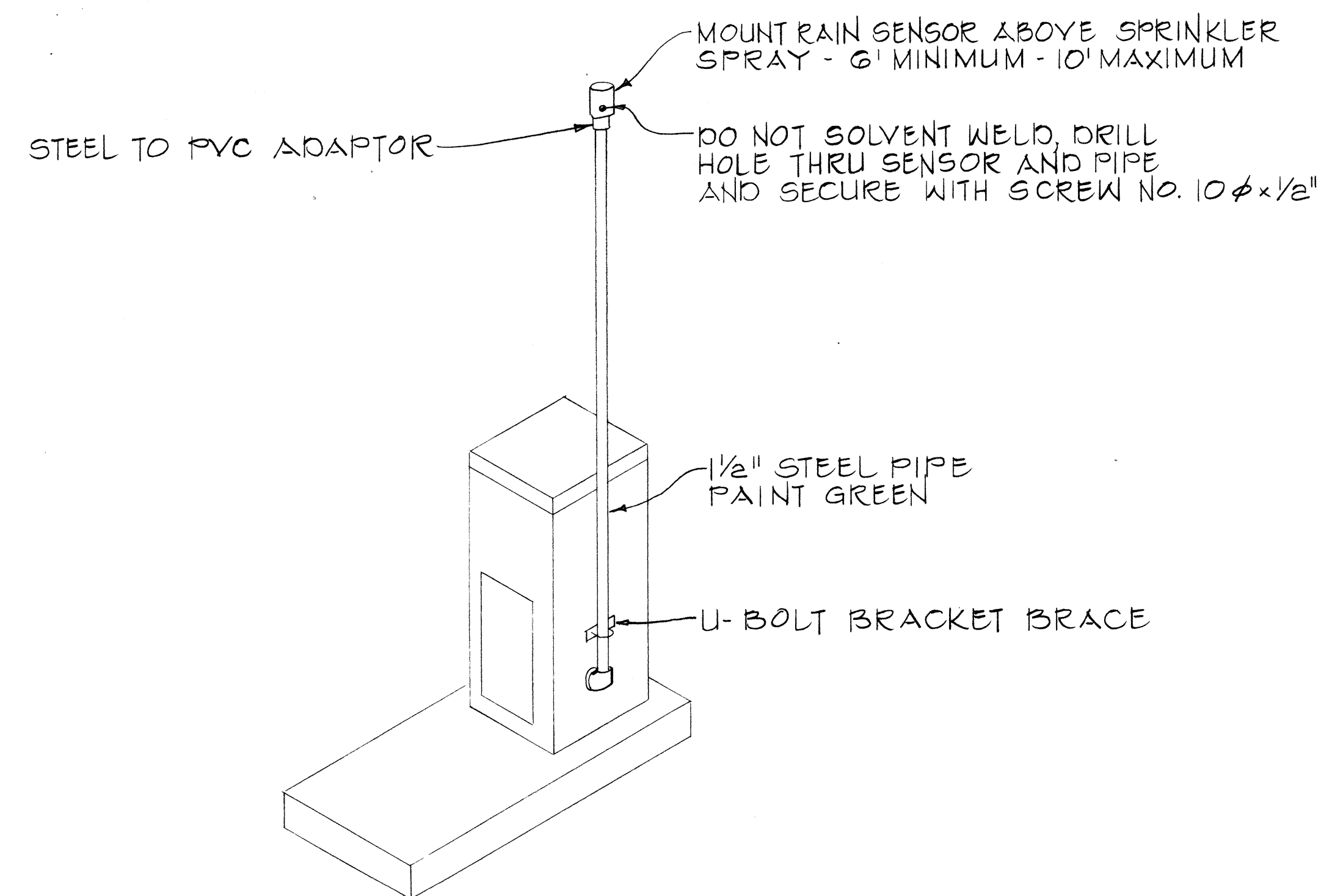
SCALE: AS SHOWN DATE: Nov. 15, 1978

SHEET No. 10 OF 11 SHEETS

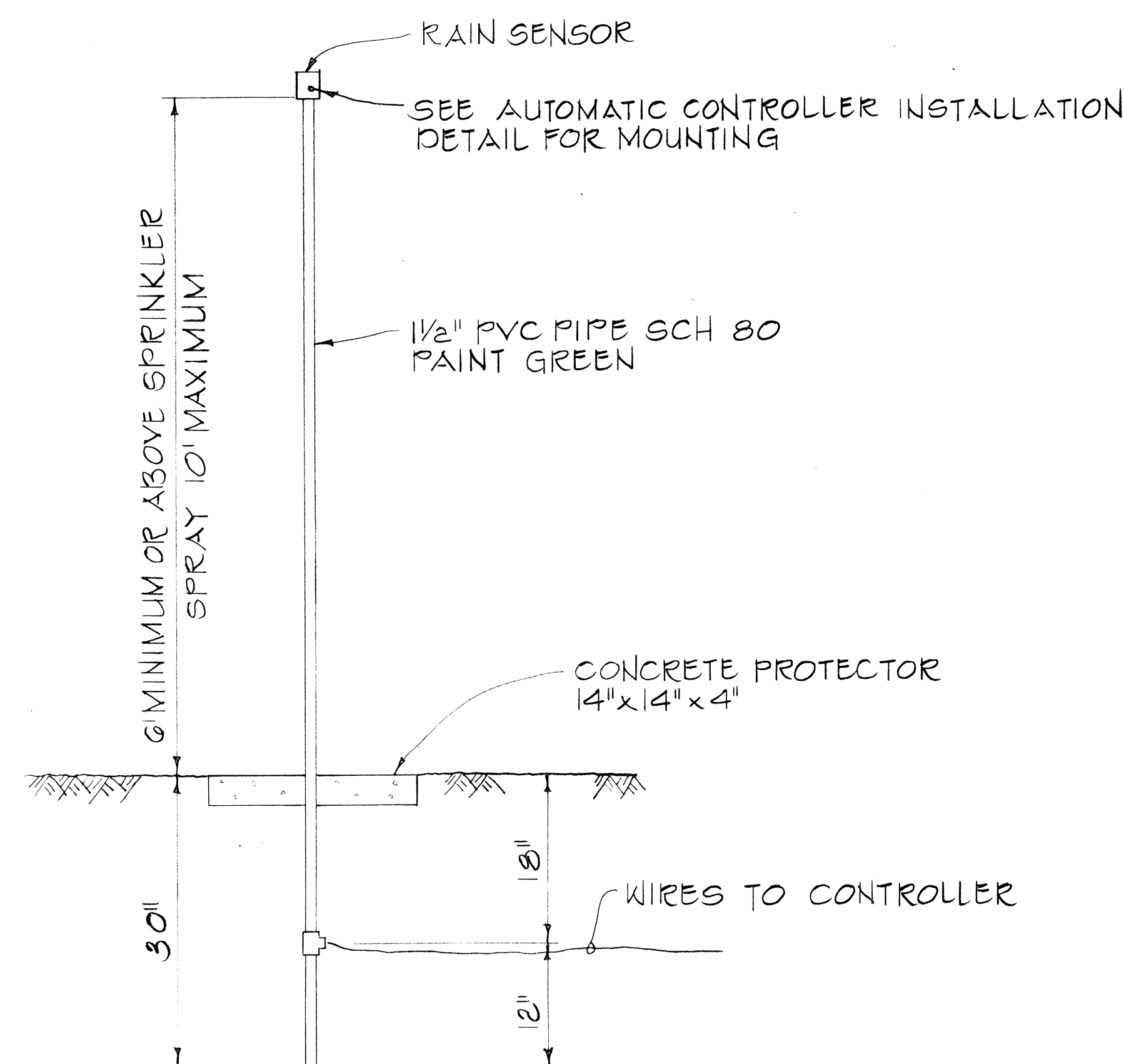
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	TOP-F-078-1(18)	1978	C0129-51	266



RAIN SENSOR WIRE DIAGRAM AT AUTOMATIC CONTROLLER



TYPICAL RAIN SENSOR INSTALLATION AT AUTOMATIC CONTROLLER

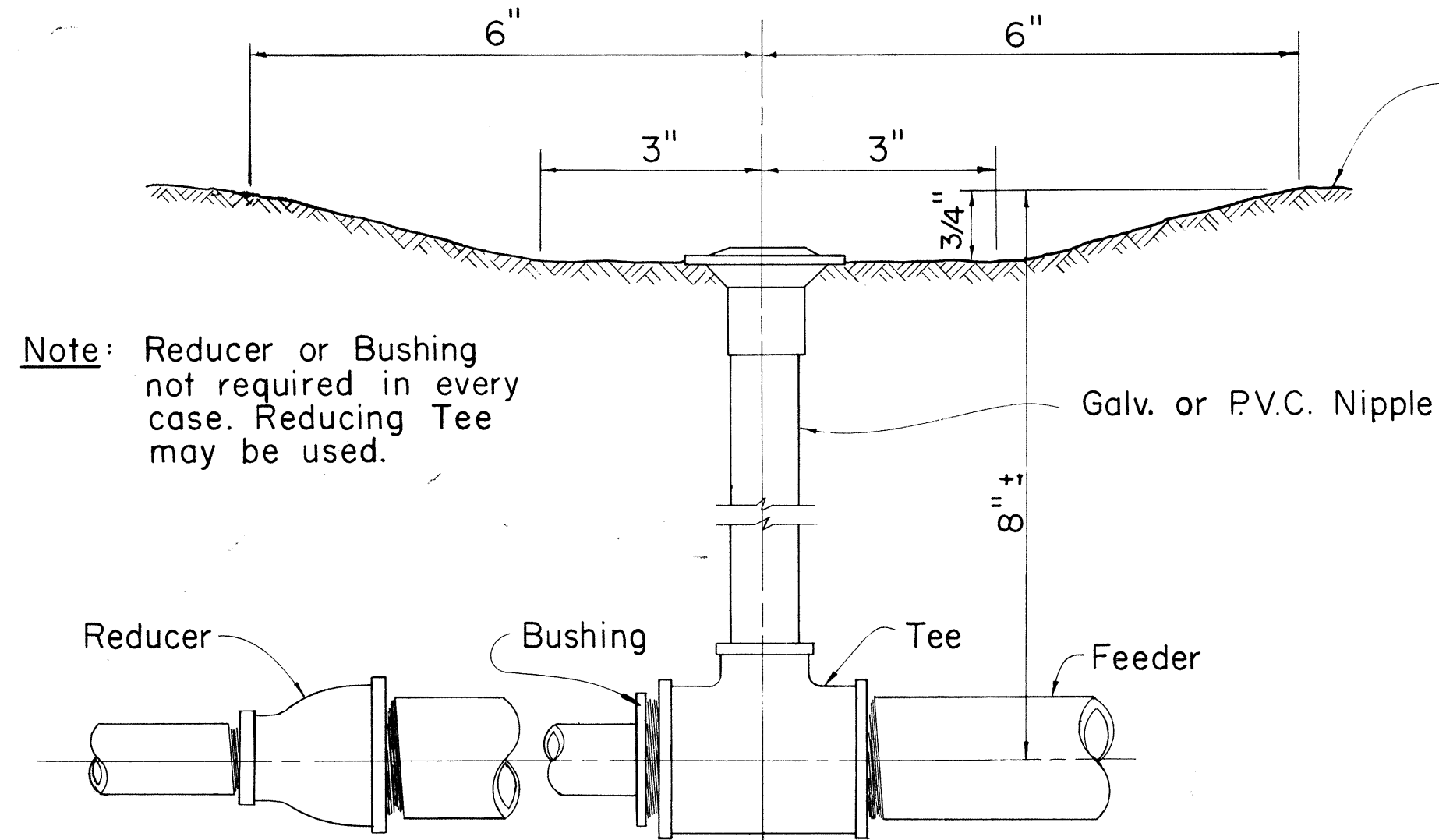


TYPICAL DETAIL RAIN SENSOR ON POLE

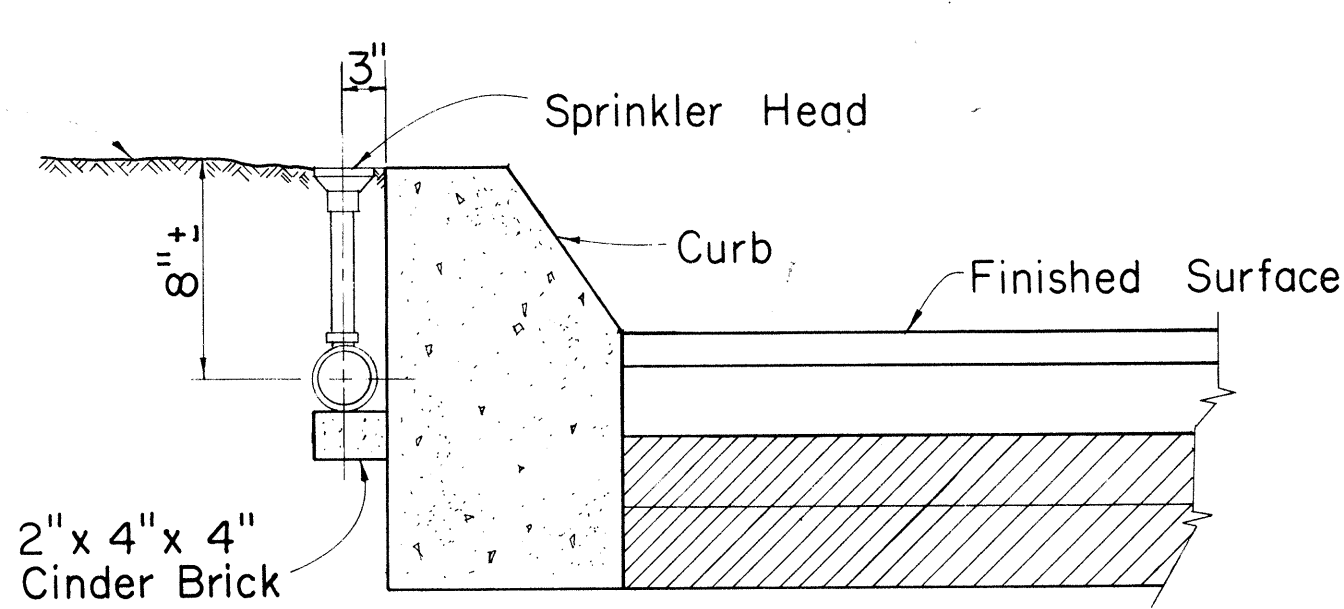
DATE	DATE
DESIGNED BY	DESIGNED BY
PLANNED BY	PLANNED BY
NOTED BY	NOTED BY
CHECKED BY	CHECKED BY
NO.	NO.

7 Dec 79	Sheet added to Contract Plan to show additional details
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION IRRIGATION SYSTEM DETAILS MOANALUA ROAD PUULOA I.C. TO MIDDLE ST-UNIT 3A F.A. Proj. No. TQF-F-078-1(18) Not to Scale Date: Dec 1979 SHEET No. 10 OF 11 SHEETS	

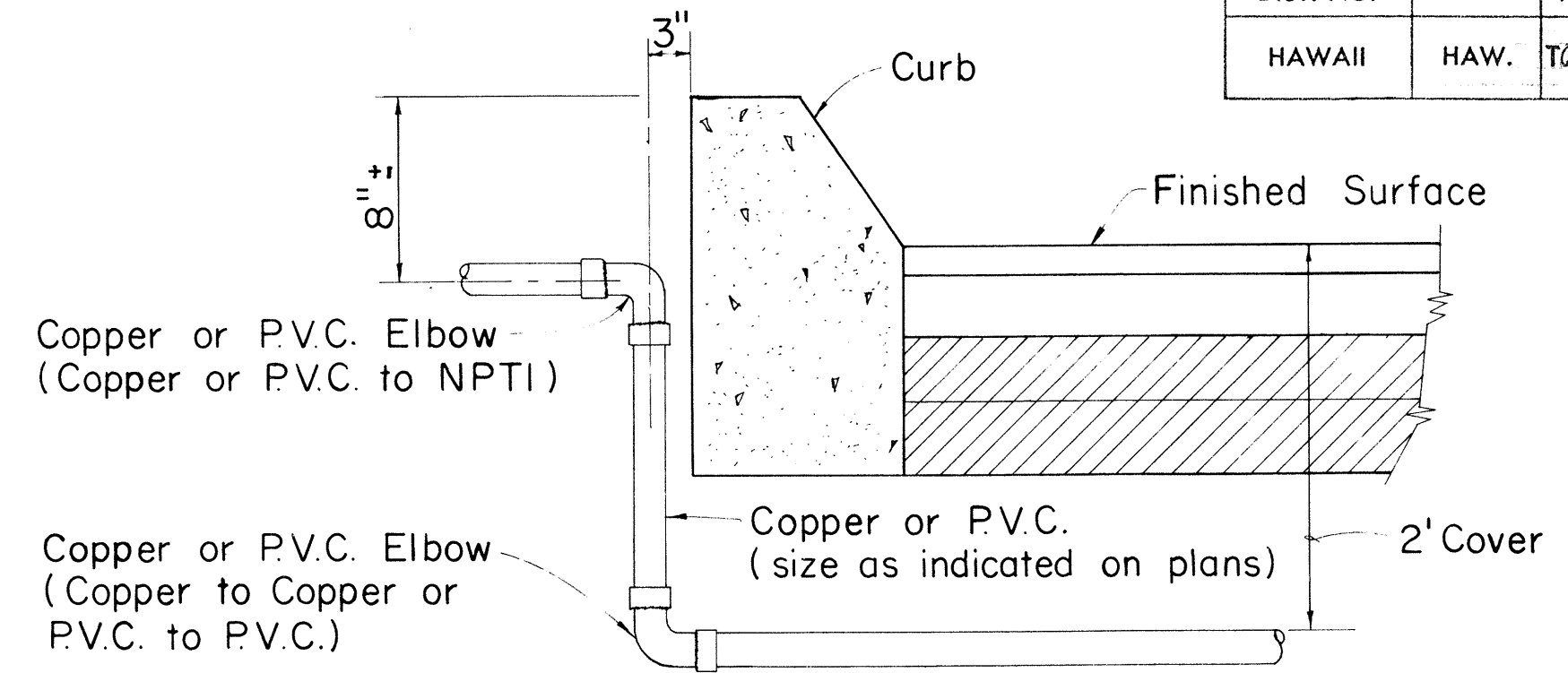
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	TQ F.078-1(8)	197	130	266



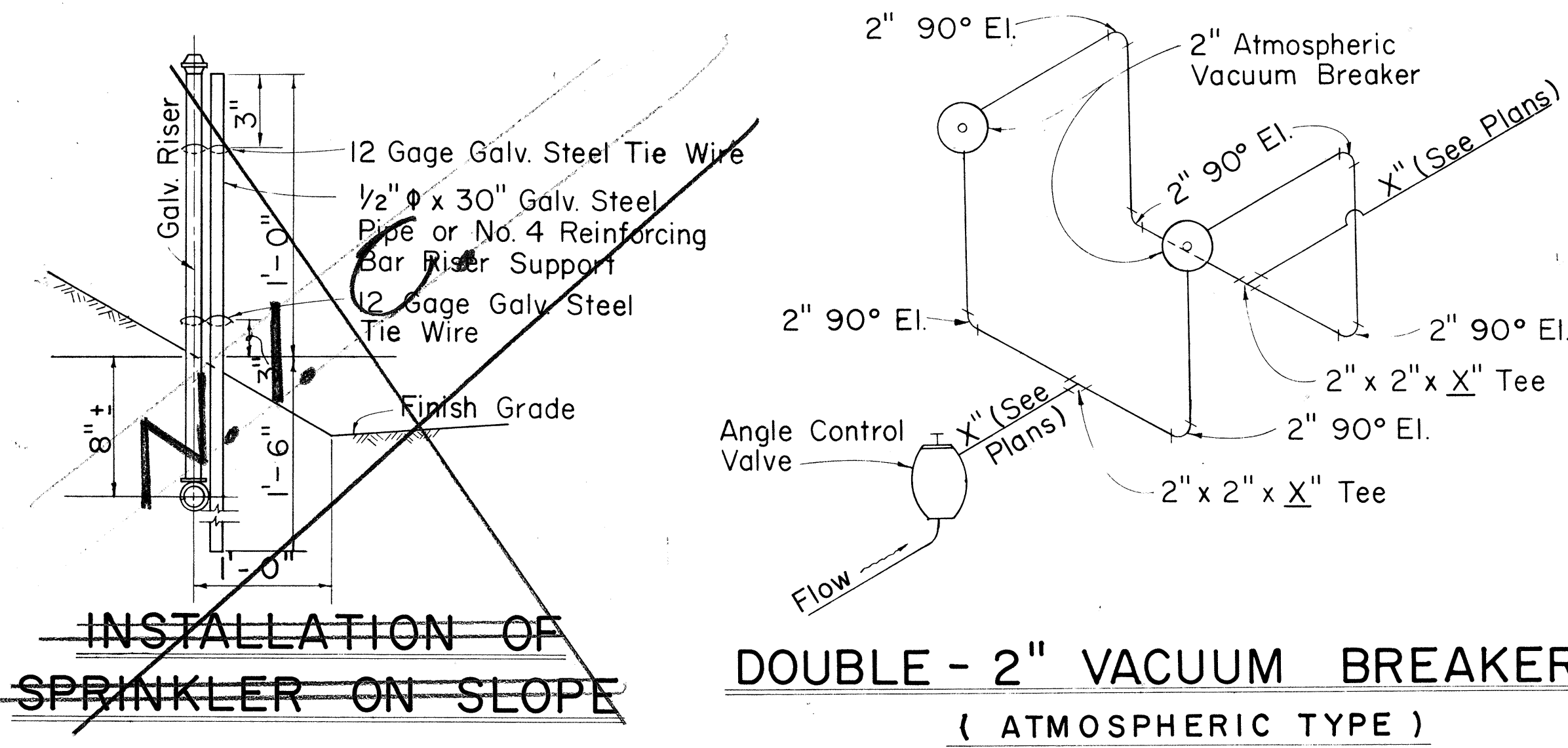
CONNECTION OF SPRINKLER HEAD TO FEEDER



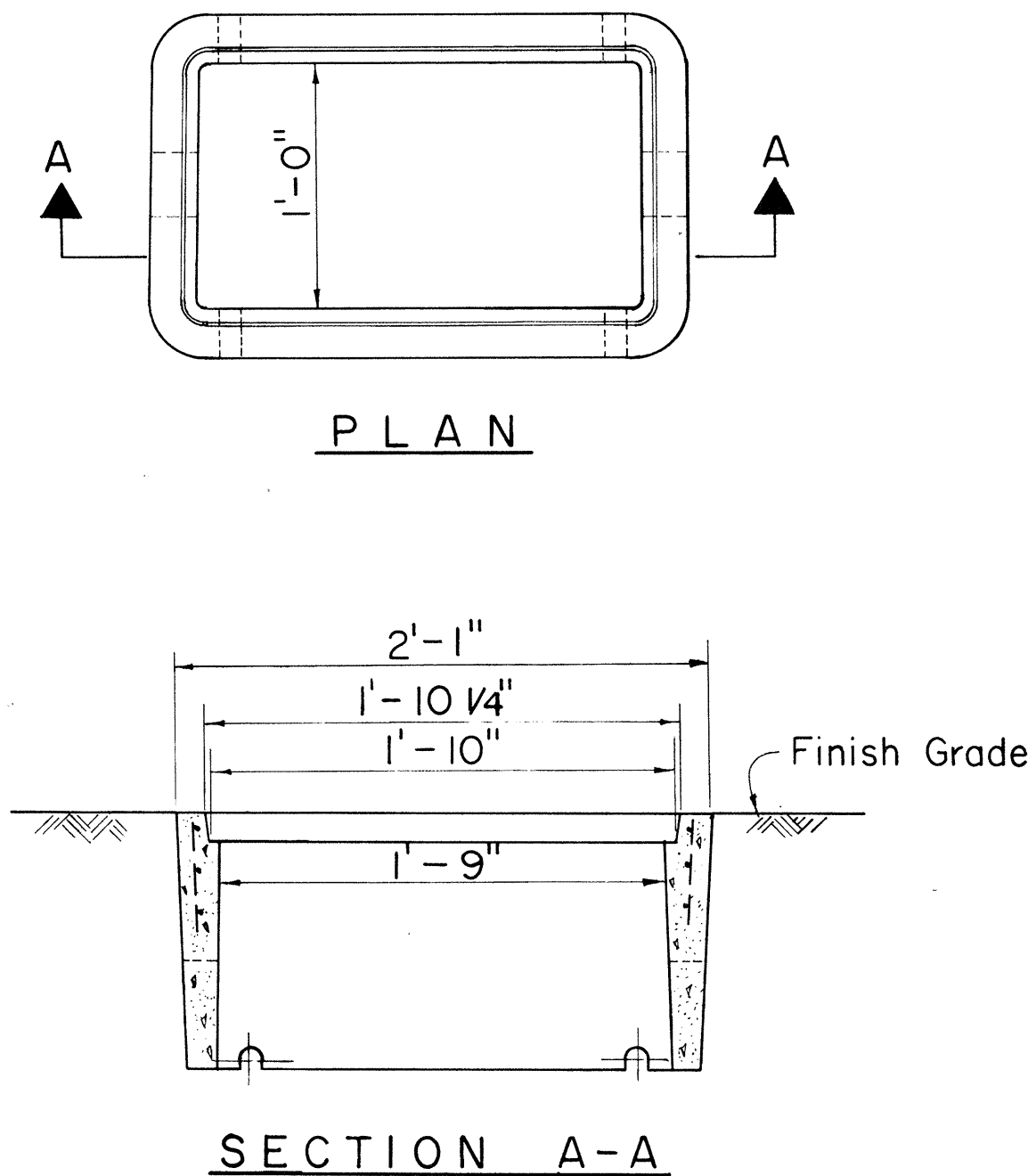
TYPICAL DETAIL OF SPRINKLER HEAD AT CONC. CURB



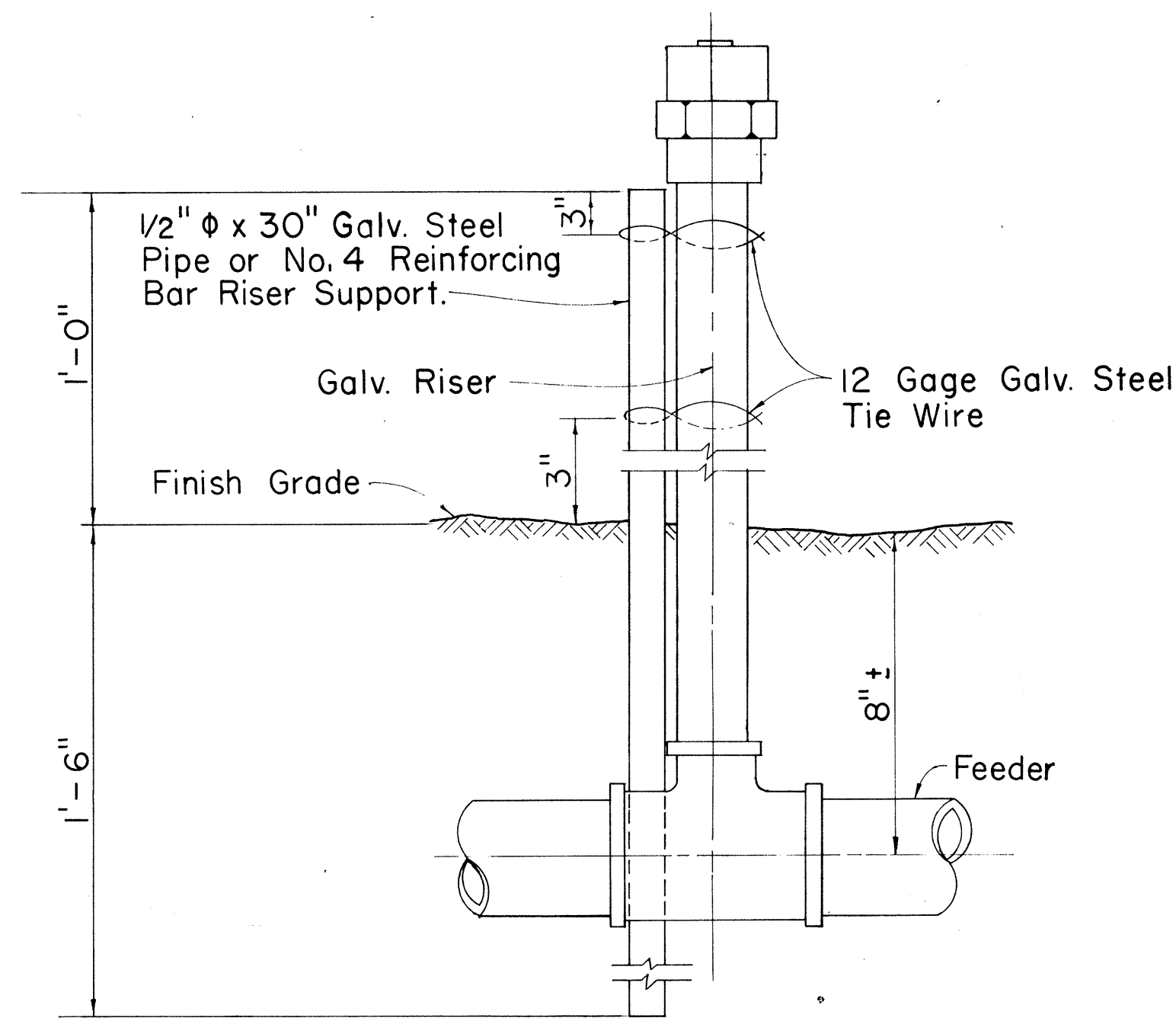
TYPICAL DETAIL OF ROADWAY CROSSING



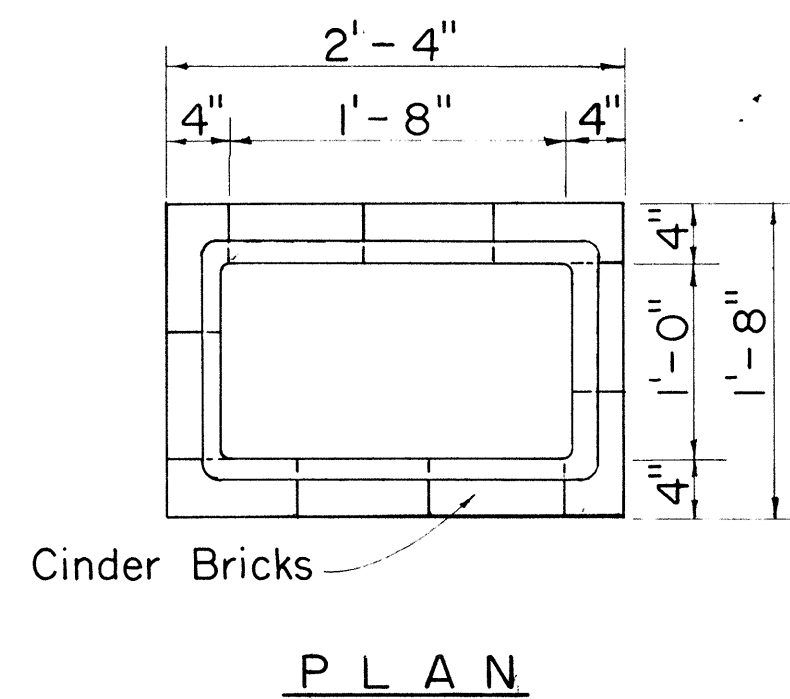
DOUBLE - 2" VACUUM BREAKER (ATMOSPHERIC TYPE)



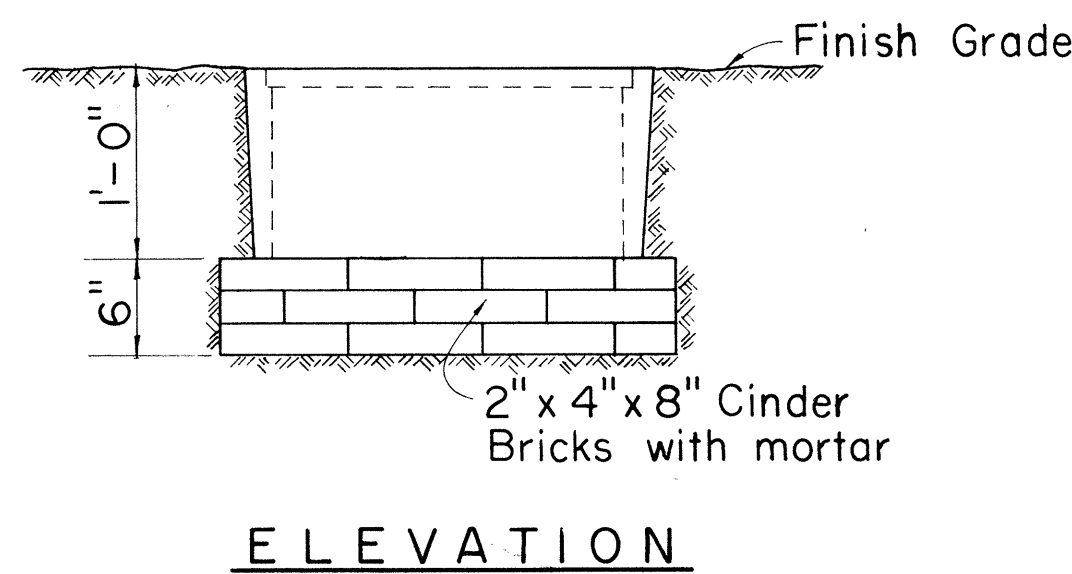
TYPE "A" VALVE BOX



DETAIL OF SPRINKLER HEAD ON RISER



PRESSURE REGULATOR BOX



GENERAL NOTES

1. Type "A" Valve Box and Pressure Regulator Box is similar to a Honolulu Board of Water Supply Type "X" Meter Box. However, instead of the words "Board of Water Supply" and "Water Meter" on the Cast Iron Covers, imprint the words "Sprinkler Valve" on the Valve Box Cover and "Pressure Regulator" on the Pressure Regulator Box Cover.
2. Locate the sprinkler valve at a sufficient depth in the Valve Box to make it operable with the cover in place.
3. Side openings in the Brick wall for the Pressure Regulator Box shall be provided to correspond to the location of the regulator inlet and outlet.
4. Riser less than 20" will not require support.
5. Riser support will be considered incidental to the various items of the sprinkler system.

APPROVAL RECOMMENDED:

 HYDRAULIC DESIGN ENGINEER 6-5-71
 DATE

APPROVED:

 ASSISTANT CHIEF, ENGINEERING 6-5-71
 DATE

NO.	REVISION	APPROVED BY	DATE
1.	This sheet supersedes sheet DH18 dated December 17, 1969.	H.C.	6-5-71

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION STANDARD DETAILS SPRINKLER SYSTEM Not to Scale SHEET No. 11 OF 11 SHEETS DH 18
