CITY & COUNTY OF HONOLULU
DEPARTMENT OF ENVIRONMENTAL SERVICES
REFUSE DIVISION

KAPAA TRANSFER STATION RENOVATIONS

100 KAPAA QUARRY ROAD
KAILUA, OAHU, HAWAII
JOB NO. 2017050 (TS)

FIRE SPRINKLER SHOP DRAWING INDEX

PAGE NO#	SHEET NO#	TITLE/DESCRIPTION
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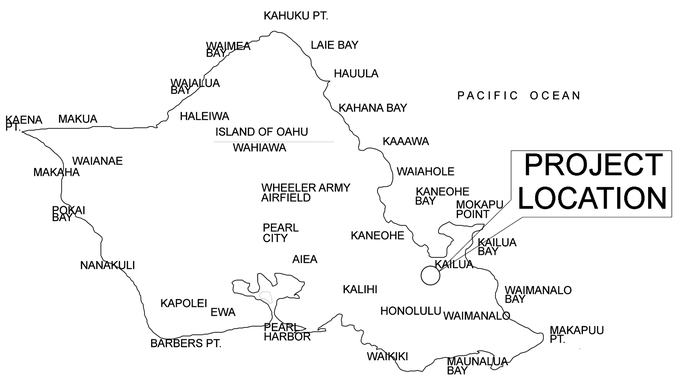
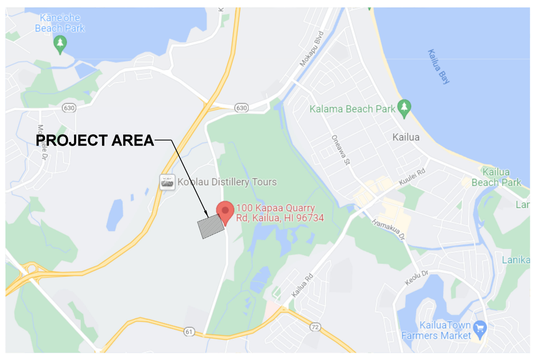
2	FS-2	RECEIVING LEVEL FIRE SPRINKLER LAYOUT
3	FS-3	LOAD OUT BAY FIRE SPRINKLER LAYOUT
4	FS-4	SECTIONS & DETAILS



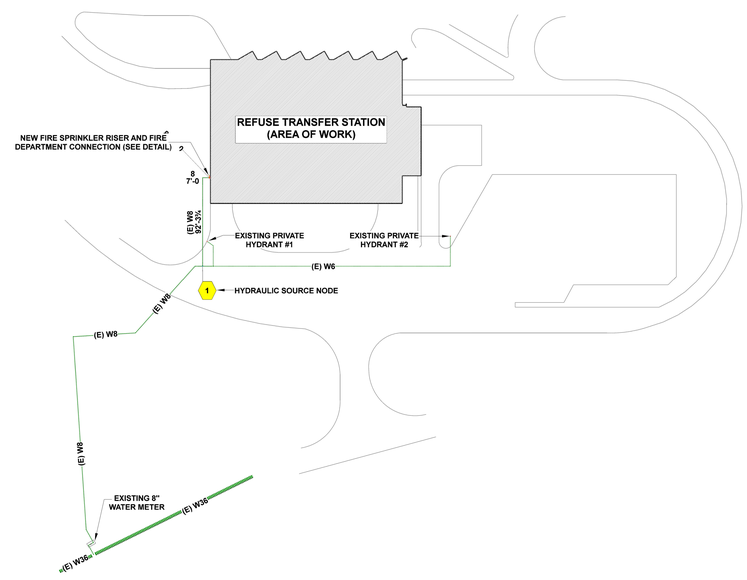
1 CITY & COUNTY OF HONOLULU (OAHU) PROJECT VICINITY MAP
NOT TO SCALE

TRUE NORTH



2 PROJECT LOCATION MAP
NOT TO SCALE

TRUE NORTH



3 FIRE SPRINKLER SYSTEM SITE PLAN (FOR HYDRAULIC REFERENCE ONLY)
SCALE: 1/64" = 1-FT

PLAN NORTH

FIRE PROTECTION NOTES

1. THE SPRINKLER SYSTEM DESIGN AND INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA 13 (2010). PROVIDE 100% FIRE SPRINKLER PROTECTION THROUGHOUT EXISTING TRANSFER STATION PROJECT AREAS. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE LOCATION OF ALL SPRINKLER COMPONENTS RELATIVE TO PARTITIONS, LIGHT FIXTURES, MECHANICAL DUCTWORK, PLUMBING AND SANITARY LINES, STRUCTURAL MEMBERS, ARCHITECTURAL FEATURES, ETC., AND COORDINATE WITH THE VARIOUS TRADES.

2. ALL DEVICES AND EQUIPMENT SHALL BE UL LISTED OR FM APPROVED

3. THE SPRINKLER SYSTEM SHALL BE HYDRAULICALLY DESIGNED AND INSTALLED IN ACCORDANCE WITH NFPA 13 (2010).

4. WATER SUPPLY INFORMATION:

STATIC PRESSURE:	105	PSI
RESIDUAL PRESSURE:	20	PSI
FLOW AT RESIDUAL PRESSURE:	4,002	GPM

SOURCE: CONSTRUCTION DOCUMENTS BY THERMAL ENGINEERING CORPORTATION.

5. THE SPRINKLER SYSTEM SHALL BE HYDRAULICALLY DESIGNED IN ACCORDANCE WITH NFPA 13 (2010) & FM DATA SHEET 3-26. SPRINKLER SYSTEM DESIGN CRITERIA SHALL BE AS FOLLOWS:

RECEIVING LEVEL & WORKING LEVEL:

OCCUPANCY CLASSIFICATION:	FM HC-3 (DATA SHEET 3-26, TABLE 2)
CEILING HEIGHT	45-60 FT.
DESIGN METHOD:	AREA DENSITY
DESIGN DENSITY:	0.50 gpm
DESIGN AREA:	3,000 sq. ft.
HOSE STREAM:	500 gpm
SPRINKLER TYPE:	STANDARD RESPONSE UPRIGHT. 200F

RECEIVING LEVEL EVE/CANOPY:

OCCUPANCY CLASSIFICATION:	FM HC-3 (DATA SHEET 3-26, TABLE 2)
CEILING HEIGHT	UP TO 30 FT.
DESIGN METHOD:	AREA DENSITY
DESIGN DENSITY:	0.30 gpm
DESIGN AREA:	2,500 sq. ft. (ENTIRE AREA)
HOSE STREAM:	500 gpm
SPRINKLER TYPE:	STANDARD RESPONSE UPRIGHT. 200F

LOAD OUT BAY:

OCCUPANCY CLASSIFICATION:	ORDINARY HAZARD GROUP 2
DESIGN METHOD:	AREA DENSITY
DESIGN DENSITY:	0.20 gpm
DESIGN AREA:	1,500 sq. ft.
HOSE STREAM:	250 gpm (APPLY AT HYDRANT)
SPRINKLER TYPE:	QUICK RESPONSE UPRIGHT, 200F

6. ALL ABOVE GROUND FIRE SPRINKLER PIPING SHALL COMPLY WITH NFPA 13 EXCEPT THAT PLASTIC PIPE SHALL NOT BE PERMITTED. ALL PIPING SHALL BE BLACK STEEL. ALL PIPING 2-INCHES AND SMALLER SHALL BE SCHEDULE 40. ALL PIPING 2-1/2-INCH OR LARGER SHALL BE SCHEDULE 10 OR SCHEDULE 40.

8. PROVIDE HYDROSTATIC TESTING OF THE NEW PIPING IN ACCORDANCE WITH NFPA 13 (2010). PRIOR TO HYDROSTATIC TESTS, THE CONTRACTOR SHALL PERFORM AN AIR PRESSURE TEST TO LOCATE THE POTENTIAL LEAKAGE POINTS.

9. ALL FIRE SPRINKLER SYSTEM CONTROL VALVES AND WATER FLOW SWITCHES SHALL BE SUPERVISED BY THE FIRE ALARM SYSTEM AT AN APPROVED 24-HOUR CENTRAL MONITORING STATION IN ACCORDANCE WITH 2012 IBC SECTION 903.4, AS AMENDED.

10. ALL FIRE SPRINKLER SYSTEM COMPONENTS SHALL BE RATED AT A MINIMUM PRESSURE OF 175 PSI. PROVIDE PRESSURE RELIEF VALVE ON EACH SYSTEM SET AT 175 PSI AS REQUIRED BY NFPA 13 (2010).

11. THE PROPER TYPES OF SPARE SPRINKLERS, STOPPERS, AND WRENCHES SHALL BE PROVIDED AND STORED IN A CABINET ADJACENT TO THE EXISTING SPARE SPRINKLER CABINET AS FOLLOWS:

A) SPRINKLERS:

LESS THAN 300 SPRINKLERS:	MINIMUM 6 SPARE SPRINKLERS
300 TO 1000 SPRINKLERS:	MINIMUM 12 SPARE SPRINKLERS
1001 OR MORE SPRINKLERS:	MINIMUM 24 SPARE SPRINKLERS

B) THREE (3) SPRINKLER STOPPERS

C) ONE (1) SPRINKLER WRENCH

THE STOCK OF SPARE SPRINKLERS, STOPPERS, AND WRENCHES SHALL INCLUDE ALL TYPES, RATINGS, AND SIZES AS THOSE INSTALLED IN THE SYSTEM.

12. FIRE SAFETY DURING CONSTRUCTION, ALTERATION, OR DEMOLITION, SHALL BE IN ACCORDANCE WITH CHAPTER 16, 2012 NFPA 1, AS AMENDED

13. THE FIRE SPRINKLER SUBCONTRACTOR SHALL HAVE A C-20 "FIRE PROTECTION" CONTRACTING LICENSE ISSUED BY THE STATE OF HAWAII.

14. ALL FIRE SUPPRESSION SYSTEM COMPONENTS SHALL BE WARRANTIED FOR A PERIOR OF 1-YEAR FROM THE DATE OF SYSTEM ACCEPTANCE TESTING.

15. ALL PENETRATIONS OF FIRE RATED WALLS AND PARTITIONS MUST BE SEALED WITH A UL LISTED FIRESTOPPING SYSTEM. INSTALLERS OF FIRESTOPPING SYSTEM SHALL BE TRAINED AND CERTIFIED BY THE SYSTEM MANUFACTURER.

16. EXTERIOR ROOFS, CANOPIES, OR SIMILAR PROJECTIONS; PER THE NFPA 13 (2010) SECTIONS OUTLINED BELOW, FIRE SPRINKLERS ARE NOT REQUIRED AT EXTERIOR EVES WHERE EVE PROJECTION DOES NOT EXCEED 4 FT.

8.15.1.2.18 SPRINKLERS SHALL BE PERMITTED TO BE OMITTED FROM WITHIN COMBUSTIBLE SOFFITS, EAVES, OVERHANGS, AND DECORATIVE FRAME ELEMENTS THAT ARE CONSTRUCTED IN ACCORDANCE WITH THROUGH 8.15.1.2.18.4.

8.15.1.2.18.1 COMBUSTIBLE SOFFITS, EAVES, OVERHANGS, AND DECORATIVE FRAME ELEMENTS SHALL NOT EXCEED 4 FT 0 IN. (1.2 M) IN WIDTH.

8.15.7.1 UNLESS THE REQUIREMENTS OF 8.15.7.2, 8.15.7.3, OR 8.15.7.4 ARE MET, SPRINKLERS SHALL BE INSTALLED UNDER EXTERIOR ROOFS, CANOPIES, PORTE-COCHERES, BALCONIES, DECKS, OR SIMILAR PROJECTIONS EXCEEDING 4 FT (1.2 M) IN WIDTH.

Designer:
IGNIS ENGINEERING
PHONE: (808) 725-3492 WWW.IGNISENGR.COM

Contractor:

[redacted]

Engineer's Stamp:

Symbols:

- HANGER ASSEMBLY
- BRANCHLINE RESTRAINT
- 4-WAY EARTHQUAKE BRACE
- 2-WAY EARTHQUAKE BRACE
- RIGID COUPLING
- FLEXIBLE COUPLING
- ★ 10'-6" FF ℄ ELEVATION ABOVE FLOOR
- ★ 0'-6" TS ℄ ELEVATION BELOW "TOP OF STEEL"
- ★ 0'-6" TS ℄ ELEV. BELOW "TOP OF STRUCTURE"
- SYSTEM RISER
- 5 HYDRAULIC NODE TAG
- 8'-0" FINISHED CEILING HEIGHT

No.	Revsion/Issue	Date

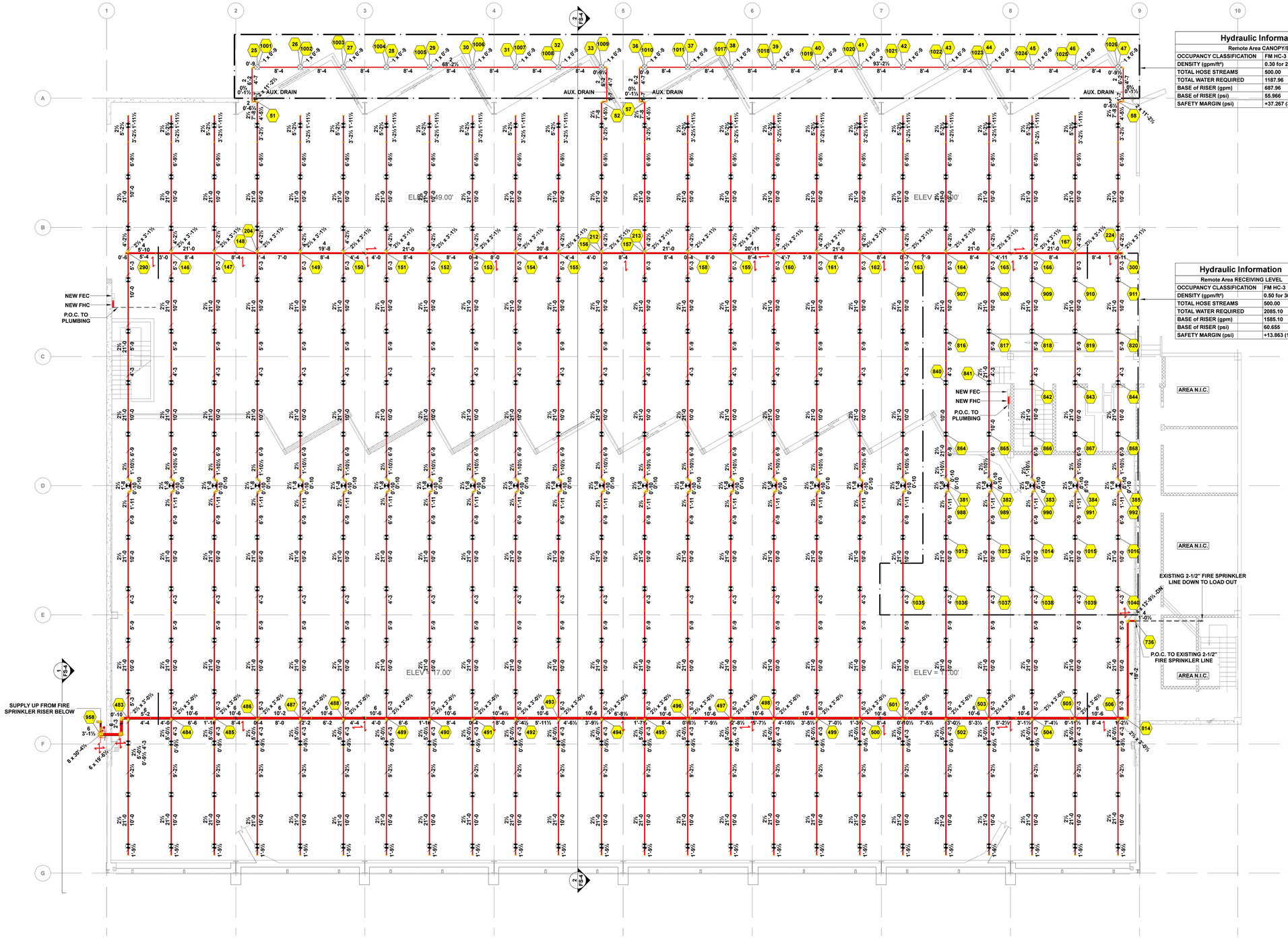
FIRE SPRINKLER SYSTEM SHOP DRAWINGS FOR:
CITY & COUNTY OF HONOLULU
DEPARTMENT OF ENVIRONMENTAL SERVICES
REFUSE DIVISION

KAPAA TRANSFER STATION RENOVATIONS
100 KAPAA QUARRY ROAD
KAILUA, OAHU, HAWAII
JOB NO. 2017050 (TS)

Drawn By: CAL	Sheet: FS-1 FIRE SPRINKLER NOTES & DETAILS
Approved By: CAL	
Date: MARCH 2ND, 2022	
Scale: AS SHOWN	SHEET 1 OF 4

Sprinkler Legend

Symbol	Manufacturer	SIN	Model	Quantity	K-Factor	Type	Size	Response	Finish	Temperature
	Minimax	MX8530	ELO	360	11.2	Upright	¾	Standard	ENT	200°F
	Minimax	MX7200	3/4 NPT	21	8	Upright	¾	Standard	ENT	200°F
				Total = 381						



Hydraulic Information

Remote Area CANOPY/EVE	
OCCUPANCY CLASSIFICATION	FM HC-3
DENSITY (gpm/ft²)	0.30 for 2500ft² (Actual 2161ft²)
TOTAL HOSE STREAMS	500.00
TOTAL WATER REQUIRED	1187.96
BASE of RISER (gpm)	687.96
BASE of RISER (psi)	55.966
SAFETY MARGIN (psi)	+37.267 (38.8%)

Hydraulic Information

Remote Area RECEIVING LEVEL	
OCCUPANCY CLASSIFICATION	FM HC-3
DENSITY (gpm/ft²)	0.50 for 3000ft²
TOTAL HOSE STREAMS	500.00
TOTAL WATER REQUIRED	2085.10
BASE of RISER (gpm)	1585.10
BASE of RISER (psi)	60.655
SAFETY MARGIN (psi)	+13.863 (17.4%)

1 **WORKING & RECEIVING LEVEL - FIRE SPRINKLER SYSTEM LAYOUT**
SCALE: 1/8" = 1-FT

0' 2' 4' 8'
1/8"=1'-0"

PLAN NORTH

Designer:

IGNIS ENGINEERING
PHONE: (808) 725-3492 WWW.IGNISENGR.COM

Contractor:

[redacted]

Engineer's Stamp:

Symbols:

- HANGER ASSEMBLY
- BRANCHLINE RESTRAINT
- 4-WAY EARTHQUAKE BRACE
- 2-WAY EARTHQUAKE BRACE
- RIGID COUPLING
- FLEXIBLE COUPLING
- ★ 10'-6" FF ℄ — ELEVATION ABOVE FLOOR
- ★ 0'-6" TS ℄ — ELEVATION BELOW "TOP OF STEEL"
- ★ 0'-6" TS ℄ — ELEV. BELOW "TOP OF STRUCTURE"
- SYSTEM RISER
- 5 — HYDRAULIC NODE TAG
- 8'-0" — FINISHED CEILING HEIGHT

No.	Revsion/Issue	Date

FIRE SPRINKLER SYSTEM SHOP DRAWINGS FOR:
CITY & COUNTY OF HONOLULU
DEPARTMENT OF ENVIRONMENTAL SERVICES
REFUSE DIVISION

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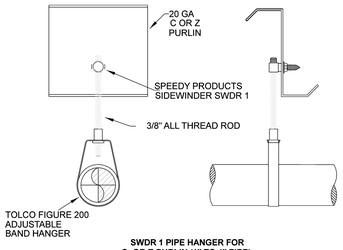
100 KAPAA QUARRY ROAD
KAILUA, OAHU, HAWAII
JOB NO. 2017050 (TS)

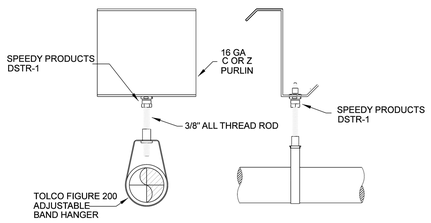
Drawn By: CAL	Sheet: FS-2 FIRE SPRINKLER SYSTEM LAYOUT
Approved By: CAL	
Date: MARCH 2ND, 2022	
Scale: AS SHOWN	SHEET 2 OF 4

Sprinkler Legend

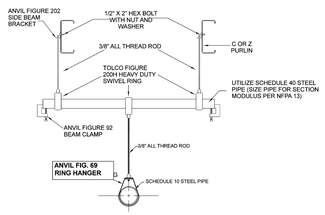
Symbol	Manufacturer	SIN	Model	Quantity	K-Factor	Type	Size	Response	Finish	Temperature	Note
⊗	Minimax	MX7350	3/4 NPT	41	8	Upright	¾	Quick	ENT	200°F	Provide head guards



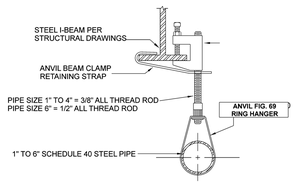
SWDR 1 PIPE HANGER FOR C- OR Z-PURLIN (1" TO 4" PIPE)



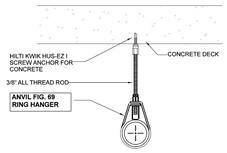
DSTR-1 PIPE HANGER FOR C- OR Z-PURLIN (1" TO 4" PIPE)



TYPICAL TRAPEZE HANGER

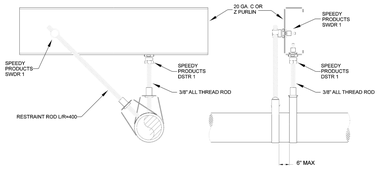


INVERTED BEAM CLAMP HANGER FOR PIPE SIZES 1" TO 6"

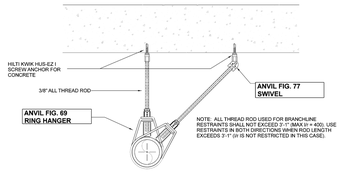


TYPICAL HANGER FOR SPRINKLER PIPING SIZED FROM 1 TO 4-INCHES

2 FIRE SPRINKLER HANGER DEATILS
NTS

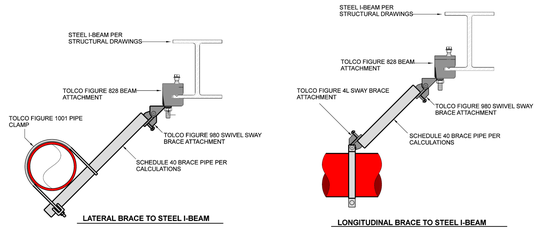


C- OR Z-PURLIN BRANCH LINE RESTRAINT

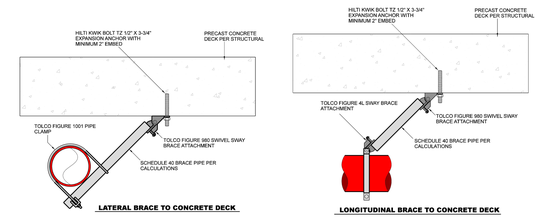


TYPICAL BRANCH LINE RESTRAINT

3 BRANCH LINE RESTRAINT DETAILS
NTS

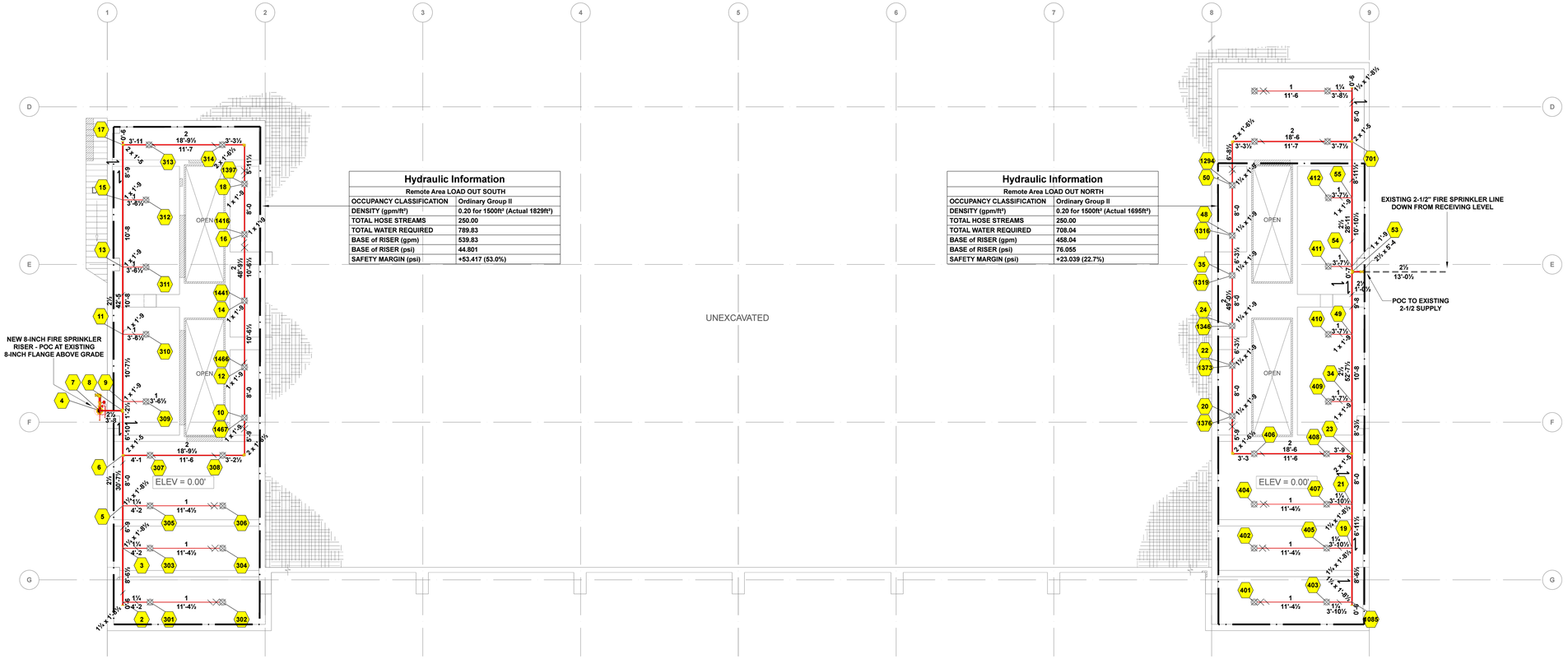


LATERAL BRACE TO STEEL I-BEAM | **LONGITUDINAL BRACE TO STEEL I-BEAM**



LATERAL BRACE TO CONCRETE DECK | **LONGITUDINAL BRACE TO CONCRETE DECK**

4 FIRE SPRINKLER SWAY BRACING DEATILS
NTS



Hydraulic Information

Remote Area LOAD OUT SOUTH	
OCCUPANCY CLASSIFICATION	Ordinary Group II
DENSITY (gpm/ft²)	0.20 for 1500ft² (Actual 1829ft²)
TOTAL HOSE STREAMS	250.00
TOTAL WATER REQUIRED	789.83
BASE of RISER (gpm)	539.83
BASE of RISER (psi)	44.801
SAFETY MARGIN (psi)	+53.417 (53.0%)

Hydraulic Information

Remote Area LOAD OUT NORTH	
OCCUPANCY CLASSIFICATION	Ordinary Group II
DENSITY (gpm/ft²)	0.20 for 1500ft² (Actual 1695ft²)
TOTAL HOSE STREAMS	250.00
TOTAL WATER REQUIRED	708.04
BASE of RISER (gpm)	458.04
BASE of RISER (psi)	76.055
SAFETY MARGIN (psi)	+23.039 (22.7%)

1 LOAD OUT BAY - FIRE SPRINKLER SYSTEM LAYOUT
SCALE: 1/8" = 1-FT

0' 2' 4' 8'
1/8"=1'-0"

PLAN NORTH

Designer:

IGNIS ENGINEERING
PHONE: (808) 725-3492 WWW.IGNISENGR.COM

Contractor:

[redacted]

Engineer's Stamp:

Symbols:

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- 5 HYDRAULIC NODE TAG
- 8'-0" FINISHED CEILING HEIGHT

No.	Revsion/Issue	Date

FIRE SPRINKLER SYSTEM SHOP DRAWINGS FOR:
CITY & COUNTY OF HONOLULU
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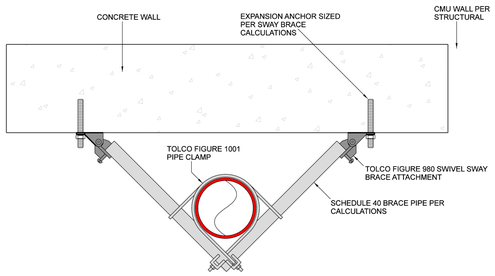
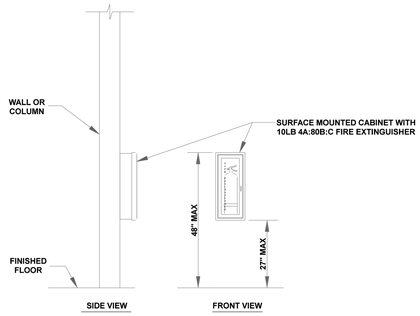
Drawn By: CAL	Sheet: FS-3 FIRE SPRINKLER SYSTEM LAYOUT
Approved By: CAL	
Date: MARCH 2ND, 2022	
Scale: AS SHOWN	SHEET 3 OF 4

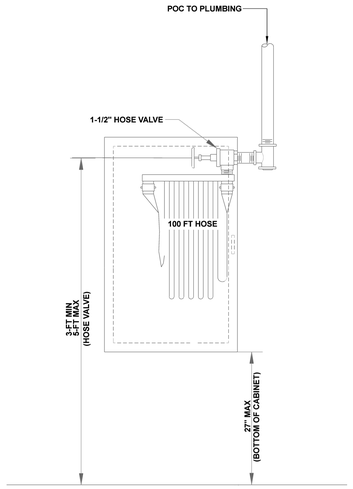


4-WAY BRACE AT TOP OF FIRE SPRINKLER RISER

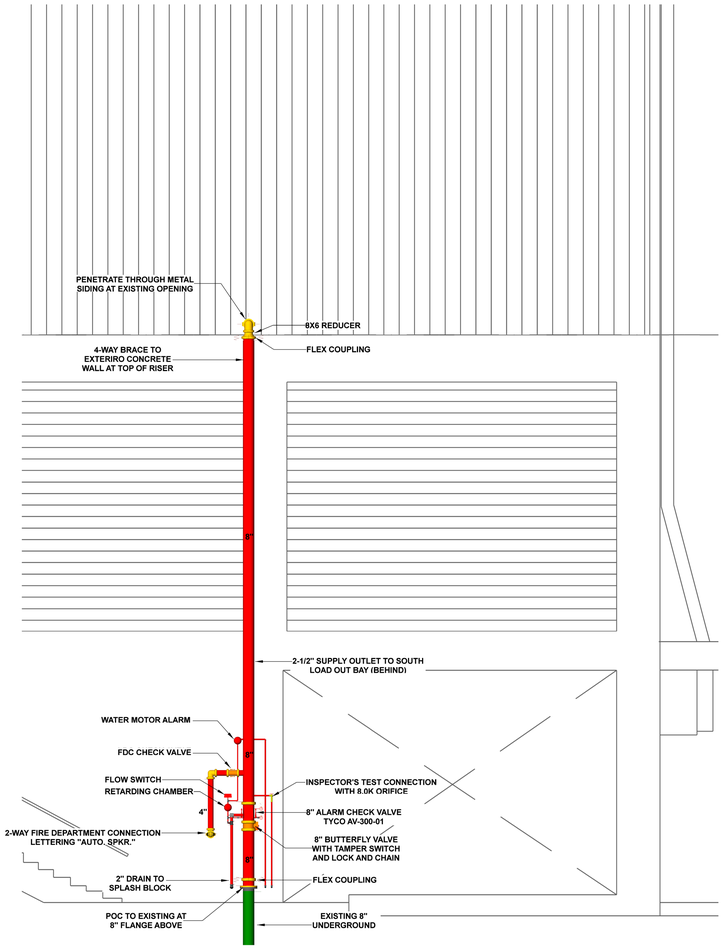
5 FOUR-WAY BRACE AT TOP OF RISER AND AT FDC
NTS



3 FIRE EXTINGUISHER CABINET DETAIL
NTS

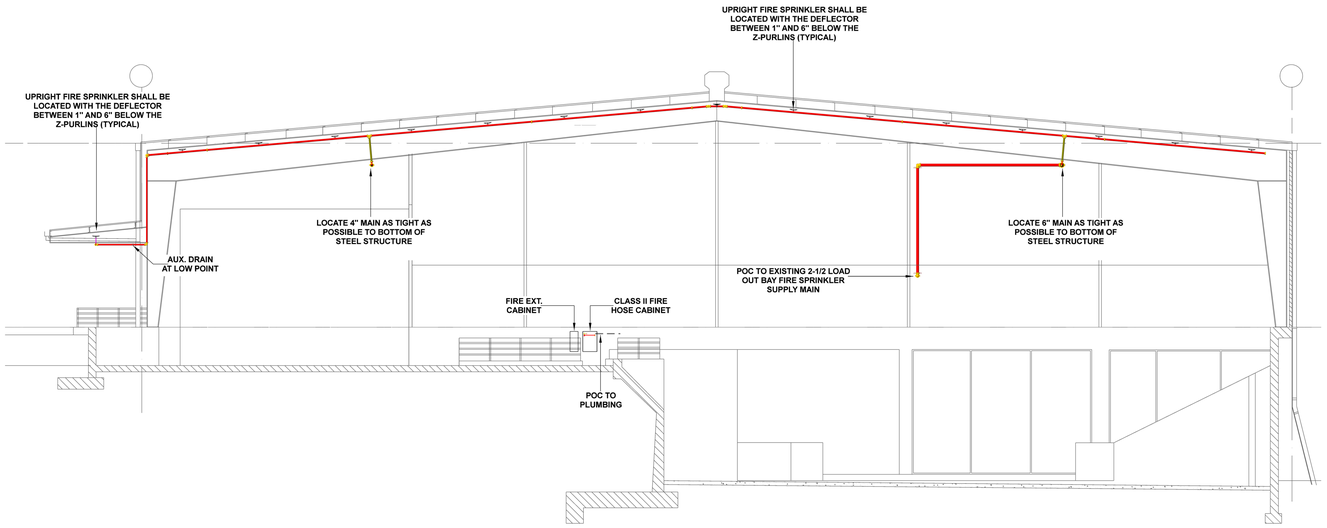


4 CLASS II HOSE CABINET DETAIL
NTS



1 KAPAA TRANSFER STATION - FIRE SPRINKLER RISER DETAIL
SCALE: 1/4" = 1-FT

0' 1' 2' 4'
1/4"=1'-0"



2 KAPAA TRANSFER STATION - FIRE SPRINKLER SYSTEM SECTION VIEW
SCALE: 1/8" = 1-FT

0' 2' 4' 8'
1/8"=1'-0"

Designer:

IGNIS ENGINEERING

PHONE: (808) 725-3492 WWW.IGNISENGR.COM

Contractor:

[redacted]

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REFUSE DIVISION

KAPAA TRANSFER STATION RENOVATIONS

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Drawn By: CAL	Sheet: FS-4 FIRE SPRINKLER SYSTEM DETAILS
Approved By: CAL	
Date: MARCH 2ND, 2022	
Scale: AS SHOWN	SHEET 4 OF 4