

ELECTRICAL PLAN - SITE WORK/LOCATION

APPROX. 1/16" = 1' - 0"

TMK:

ELECTRICAL PLAN NOTES

1. ELECTRICAL PLAN IS DIAGRAMMATIC AND SHOWS CIRCUITING REQUIREMENTS ONLY. (EXCEPT AS MAY BE INDICATED.)
2. CONDUITS SHALL BE SIZED CORRECTLY PER NEC REQUIREMENTS DEPENDING ON THE HOMERUN GROUPINGS SELECTED BY THE CONTRACTOR.
3. ALL CONDUITS SHALL BE EXPOSED ON CEILINGS AND WALLS UNLESS REQUIRED OTHERWISE.
4. ALL PANELBOARDS SHALL BE CIRCUITED AS INDICATED ON THE DRAWINGS. DO NOT CHANGE WITHOUT THE APPROVAL OF THE ENGINEER.
5. ALL PANELBOARDS SHALL HAVE TYPEDWRITTEN DIRECTORIES AND IN THE FORMAT AS INDICATED ON THE SCHEDULES, I.E., SAME PHYSICAL ARRANGEMENT AS PANELBOARD.
6. PROVIDE A NEUTRAL CONDUCTOR FOR EACH SET OF PHASE CONDUCTORS.
7. PROVIDE A GROUNDING CONDUCTOR FOR ALL CIRCUITS. DO NOT USE CONDUIT OR RACEWAY FOR CIRCUIT GROUNDING. WHERE INDICATED OR REQUIRED, A DEDICATED AND/OR ISOLATED GROUND CONDUCTOR/SYSTEM SHALL BE PROVIDED.
8. DRAWINGS ARE INTENDED TO BE COMPLETE AS TO GENERAL INTENT AND REQUIREMENTS BUT NOT TO ACTUAL DETAILS OF CONSTRUCTION, INSTALLATION, AND LOCATIONS.

PROJECT NOTES

1. INSPECT AND VERIFY EXISTING ELECTRICAL SYSTEM AND WORKING CONDITIONS PRIOR TO SUBMITTING BIDS OR PROPOSALS.
2. RESOLVE ALL QUESTIONS AND DISCREPANCIES W/ ENGINEER PRIOR TO START OF ANY ELECTRICAL WORK.
3. ALL ELECTRICAL WORK SHALL COMPLY WITH HAWAII COUNTY ORDINANCES.
4. ALL MATERIALS AND EQUIPMENT SHALL BE "LISTED" OR "LABELLED" AND APPROVED FOR THE PURPOSE AS DEFINED BY THE NATIONAL ELECTRICAL CODE (NEC).
5. PRIOR TO INSTALLING ANY ELECTRICAL ITEM, VERIFY ITS FINAL LOCATION. COORDINATE AND ADJUST LOCATIONS AS REQUIRED.
6. CONDUIT TYPE AND INSTALLATION SHALL COMPLY WITH THE MINIMUM REQUIREMENTS OF THE NEC. CONDUCTORS SHALL BE NEC TYPE THWN.
7. WIRING SYSTEM AND EQUIPMENT IN AREAS CLASSIFIED AS HAZARDOUS BY THE DEPARTMENT OF PUBLIC WORKS, COUNTY OF HAWAII, SHALL BE FURNISHED AND INSTALLED PER APPLICABLE ARTICLES OF THE NEC.
8. CONTRACTOR SHALL SCHEDULE AND COORDINATE ALL POWER OUTAGES WITH THE OWNER. OUTAGES SHALL BE GIVEN AT THE CONVENIENCE OF THE OWNER. CONTRACTOR SHALL EXPEDITE ALL WORK TO KEEP THE OUTAGE TIME TO A MINIMUM AND WITHIN THE TIME ALLOWED BY THE OWNER AND AGREED TO BY THE CONTRACTOR.
9. PATCHING WORK AFTER CUTTING, DRILLING, ETC., SUBJECT TO APPROVAL OF OWNER OR ENGINEER.
10. TEST COMPLETED INSTALLATION FOR CORRECT AND PROPER OPERATION.
11. WORKMANSHIP SUBJECT TO APPROVAL AND ACCEPTANCE BY ENGINEER AND OWNER.
12. COMPLETE INSTALLATION SHALL BE UNCONDITIONALLY GUARANTEED FOR ONE YEAR AFTER FINAL ACCEPTANCE BY THE OWNER.

GENERAL NOTES:

1. ALL ELECTRICAL ITEMS INDICATED ON THE DRAWINGS ARE NEW AND SHALL BE PROVIDED BY THE CONTRACTOR UNLESS INDICATED AS "EXISTING", OR AS OTHERWISE NOTED.
2. ALL LOCATIONS SHOWN ON THE DRAWING FOR ITEMS OF WORK TO BE FURNISHED AND/OR INSTALLED ARE APPROXIMATE. THE CONTRACTOR SHALL SELECT LOCATIONS TO SUIT FIELD CONDITIONS SUBJECT TO APPROVAL OF THE ENGINEER.
3. CONTRACTOR SHALL INDICATE ALL FINAL LOCATIONS ON THE "AS-BUILT" DRAWINGS WHERE THEY DIFFER FROM THAT SHOWN ON THE DRAWINGS.
4. CONTRACTOR SHALL CHECK AND MAINTAIN ORIGINAL PHASE ROTATION AND PHASE RELATIONSHIPS ON ALL CIRCUITS.
5. ALL ELECTRICAL EQUIPMENT SHALL BE NEW AND WARRANTED BY THE MANUFACTURER.
6. ALL ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, NATIONAL ELECTRICAL SAFETY CODE, AND FEDERAL, STATE, AND COUNTY GOVERNMENT STANDARDS, REGULATIONS, AND ORDINANCES.
7. ALL EXPOSED CONDUITS AND FITTINGS, AND METAL PORTIONS OF EQUIPMENT ENCLOSURE SHALL BE FIELD PAINTED FOR CORROSION PROTECTION.
8. ALL EQUIPMENT SHALL BE PROPERLY MOUNTED, ANCHORED, AND SUPPORTED BY APPROVED METHODS FOR SEISMIC RESTRAINT OF .36G FORCES.
9. ACCESS PATHS FOR EQUIPMENT INSTALLATION ARE LIMITED AND CONGESTED. SPECIAL RIGGINGS, RAMPS, ROLLERS, SUPPORTS, ETC., WILL BE REQUIRED. CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE SITE WORKING CONDITIONS AND SECURITY ACCESS REQUIREMENTS PRIOR TO BIDDING. (CONTRACTOR SHALL NOT ALTER THE STRUCTURE OF BUILDING IN ANY WAY TO PROVIDE EQUIPMENT ACCESS PATHS. ONLY EXISTING DEFINED EQUIPMENT ACCESS PATHS SHALL BE UTILIZED.)
10. ALL RACEWAYS/CONDUITS CROSSING EXPANSION JOINTS SHALL HAVE APPROVED TYPE FITTINGS AS REQUIRED FOR THE APPLICATION.
11. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY RUNS, CONNECTIONS AND ACCESSORIES (MATERIAL AND LABOR) NOT SHOWN BUT WHICH ARE REQUIRED TO COMPLETE THE SCOPE OF WORK AS INDICATED ON THE PLANS OR NEEDED TO COMPLETE THE INSTALLATION OF ALL EQUIPMENT INDICATED IN THE PLANS AND SPECIFICATIONS SUBJECT TO THE APPROVAL OF THE ENGINEER. COST OF THESE CONNECTIONS SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE.

DISCLOSURE NOTE

THESE PLANS ARE INTENDED TO BE USED FOR BUILDING AND ELECTRICAL PERMIT PURPOSES ONLY, AND SOLELY FOR USE BY THE DESIGNATED OWNER AND CONTRACTOR. THESE PLANS ARE NOT INTENDED FOR GENERAL RELEASE AND DISTRIBUTION. THE MAIN INTENT AND PURPOSE OF PLANS ARE TO CONSTRUCT THE ELECTRICAL WORK IN ACCORDANCE WITH THE MINIMUM REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE AND OTHER APPLICABLE CODES, STANDARDS, RULES AND REGULATIONS. THESE PLANS ARE NOT INTENDED TO COVER CONSTRUCTION DETAILS AND IMPLEMENTATION. ANY AND ALL QUESTIONS SHALL BE RESOLVED WITH THE ENGINEER PRIOR TO START OF ANY WORK.

PROPRIETARY NOTE

THESE PLANS SHALL NOT BE COPIED, REPRODUCED, OR USED IN ANY FORM OR MANNER WITHOUT THE WRITTEN AUTHORIZATION OF THE ENGINEER. ANY USE OF MATERIAL ON THE PLANS BY MINOR ALTERATIONS, RE-WORDING, OR REVISIONS TO OBTAIN ORIGINALLY INTENDED MEANINGS OR RESULTS SHALL BE PROHIBITED.

EXCLUSIVE NOTE

THESE PLANS ARE FOR THE EXCLUSIVE USE BY "CALTECH SUBMILLIMETER OBSERVATORY" ONLY.

ELECTRICAL PLAN SYMBOLS

	* - EQUIPMENT AS IDENTIFIED
	PANELBOARD
	TRANSFORMER
	EXPOSED CONDUIT, WHERE USED, HASH LINES INDICATE QTY OF WIRES
	EXPOSED CONDUIT, HIDDEN FROM VIEW ON PLAN
	EMBEDDED CONDUIT, BELOW FLOOR SLAB, EXTERIOR FINAL GRADE
	FLEXIBLE METAL CONDUIT, LIQUIDTIGHT
	EQUIPMENT OR OTHER ELECTRICAL CONNECTION AS INDICATED
	CONTROL DEVICE OR ITEM CONNECTION AS IDENTIFIED

ABBREVIATIONS

A	AMPERE
AF	AMPERE FRAME
AIC	AMPERE INTERRUPTING CAPACITY
AT	AMPERE TRIP
C	CONDUIT
CB	CIRCUIT BREAKER
D	DEEP
(E)	EXISTING
E, ELEC	ELECTRIC, ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
FBO	FURNISHED BY OWNER OR OTHERS
G, GND	GROUND
H	HORIZONTAL OR HIGH
HELCO	HAWAII ELECTRIC LIGHT COMPANY
IBC	INSTALLED BY CONTRACTOR
IBO	INSTALLED BY OWNER OR OTHERS
JBX	JUNCTION BOX
L	LIGHTS, LIGHTING, LONG, LENGTH
LTFMC	LIQUIDTIGHT FLEXIBLE METAL CONDUIT
LTFNMC	LIQUIDTIGHT FLEXIBLE NON-METALLIC CONDUIT
N	NEUTRAL
(N)	NEW
NEC	NATIONAL ELECTRICAL CODE
P	POLE
PBX	PULLBOX
PFB	PROVISIONS FOR FUTURE BREAKER
PH	PHASE
PNLBD	PANELBOARD
R	RECEPTACLE
RMC	RIGID METAL CONDUIT (STEEL)
(TYP)	TYPICAL
UG	UNDERGROUND
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTS, VERTICAL
W	WIRE(S), WIDE, WATTS

DEFINITIONS

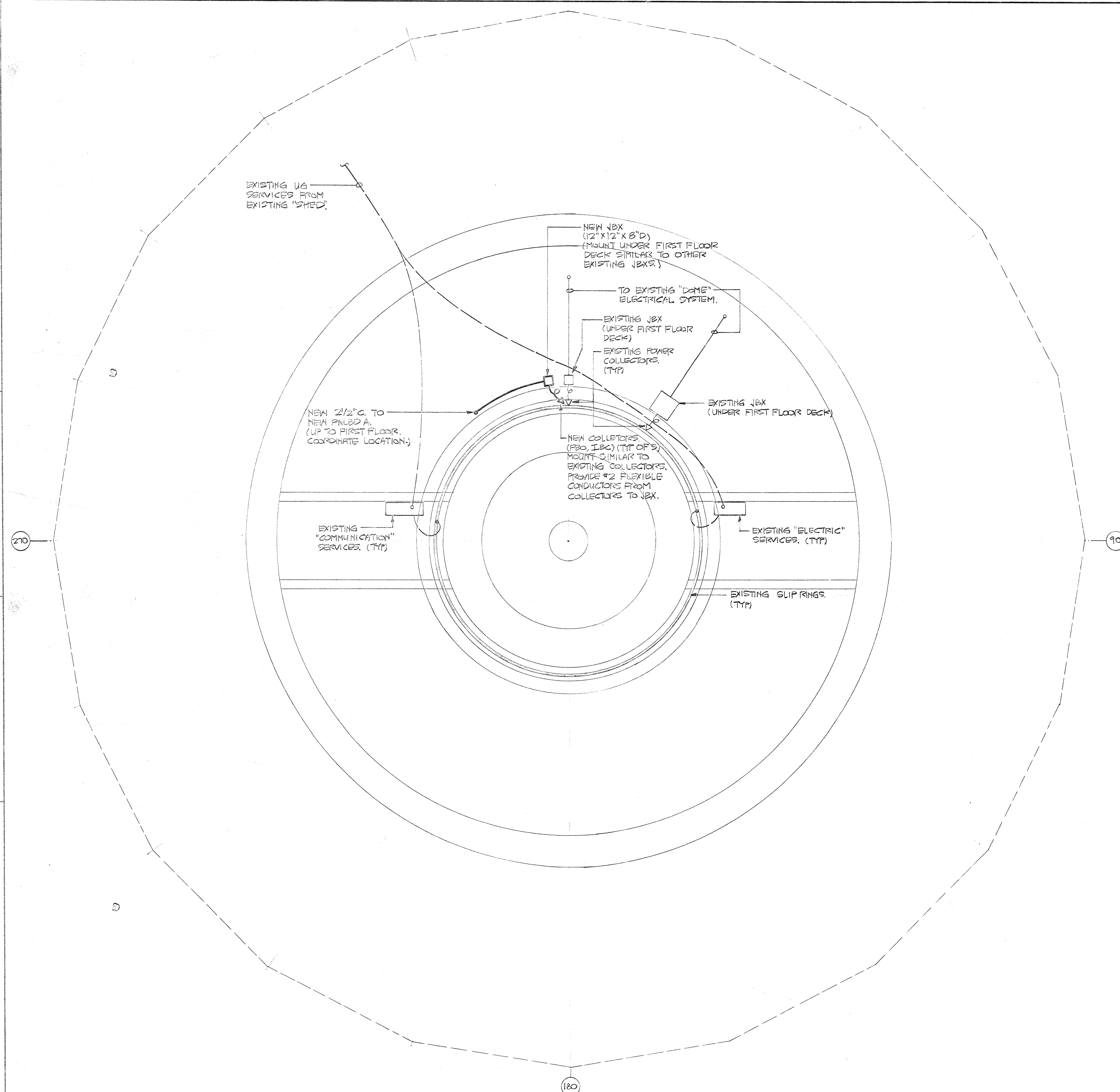
WIRING - ALL CONDUITS, RACEWAYS, CONDUCTORS, FITTINGS, PULLBOXES, JUNCTION BOXES, OUTLET BOXES, DEVICES, AND OTHER MATERIALS OR ITEMS AS NECESSARY FOR A COMPLETED AND OPERATIONAL ELECTRICAL CIRCUIT OR SYSTEM; OR THAT COMPRISES AN ELECTRICAL CIRCUIT OR SYSTEM.

OUTLET - IN ADDITION TO DEFINITION IN THE NEC, OUTLET SHALL MEAN THE REQUIRED OUTLET BOXES, CONDUCTORS, TERMINATIONS, WIRING DEVICES, AND COVER PLATES, TO PROVIDE FOR THE INTENDED USE, APPLICATION, OR UTILIZATION EQUIPMENT.

FOR REVIEW ONLY

DATE JUL 22 1998

ELECTRICAL ADDITIONS FOR "MPI" CALTECH SUBMILLIMETER OBSERVATORY		MAUNA KEA MOUNTAIN	
CALTECH SUBMILLIMETER OBSERVATORY		111 NOWELO STREET	
HILO, HAWAII 96720		RICHARD CHAMBERLIN 935-1909/FAX:961-6273	
WALLACE T. OKI, P.E., INC.	REF. NO.	SHT.	DWG. NO.
ELECTRICAL ENGINEERING	798131	I	E-1
P.O. BOX 4070/688 KINOOLE ST., STE. 115B	OF		
HILO, HI. 96720 PH:961-9666/FAX:935-2549			



ELECTRICAL PLAN - FOUNDATION

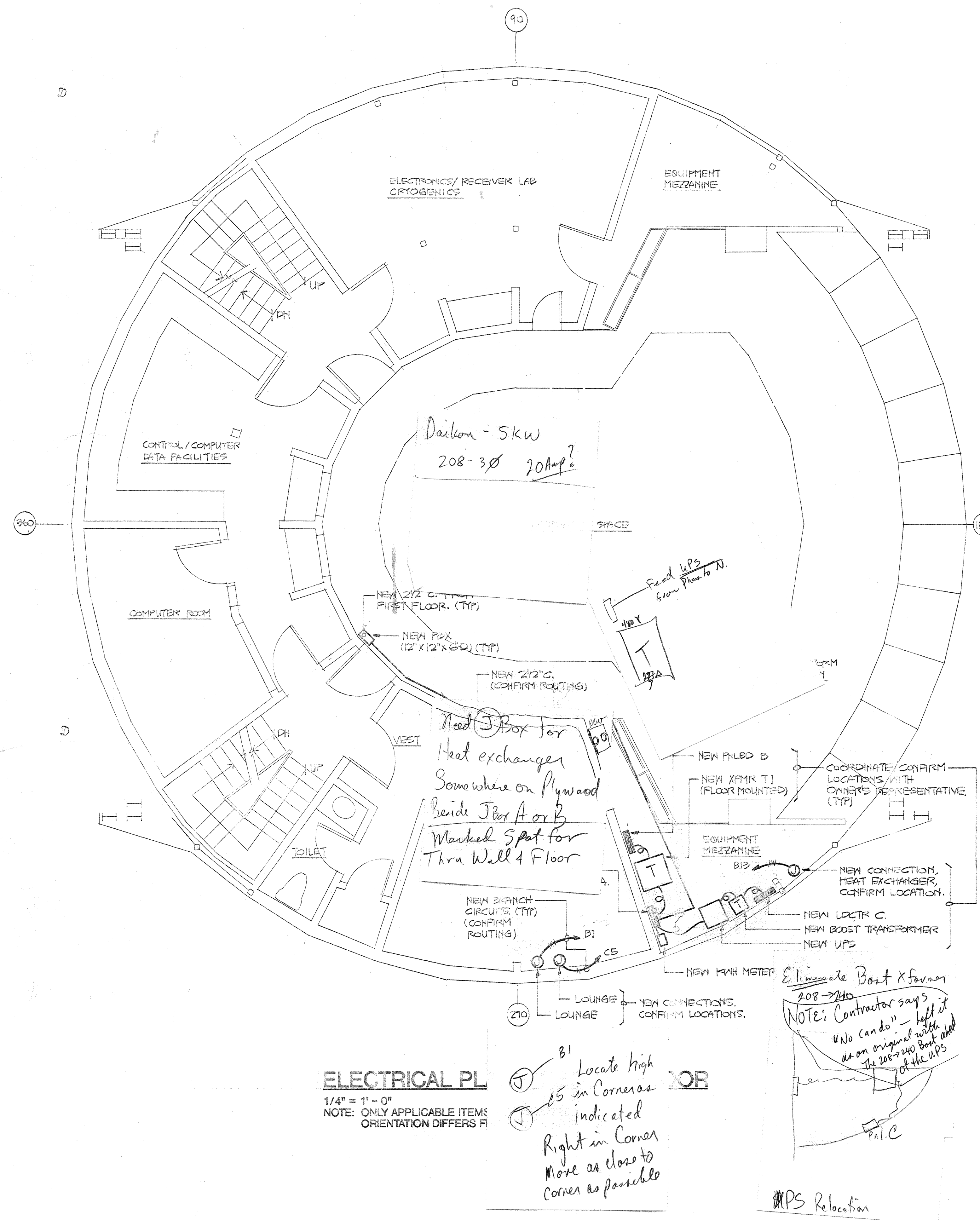
1/4" = 1' - 0"

NOTE: ONLY APPLICABLE ITEMS ARE INDICATED.

FOR REVIEW ONLY

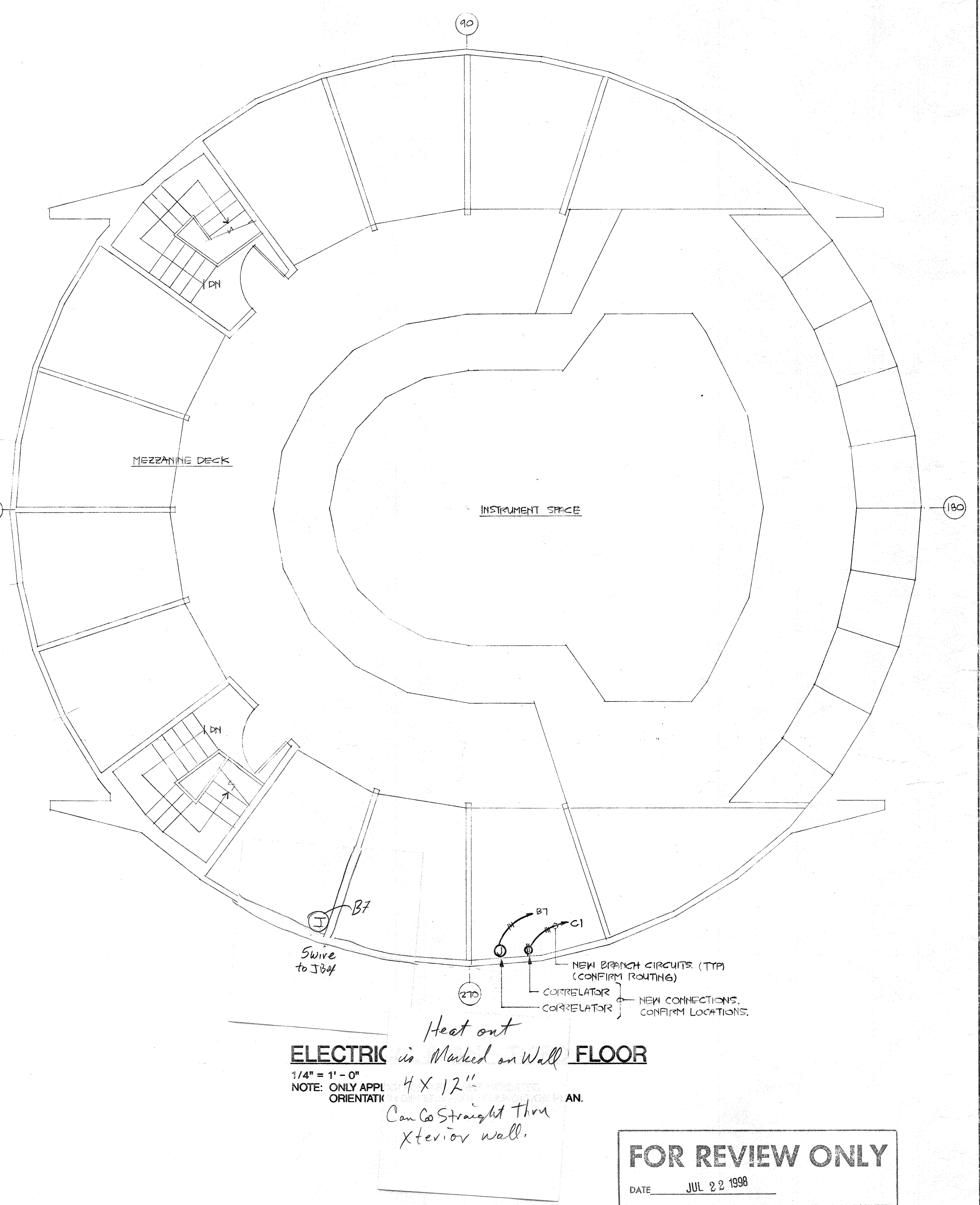
DATE JUL 22 1998

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ELECTRICAL PL
1/4" = 1' - 0"
NOTE: ONLY APPLICABLE ITEMS ORIENTATION DIFFERS F

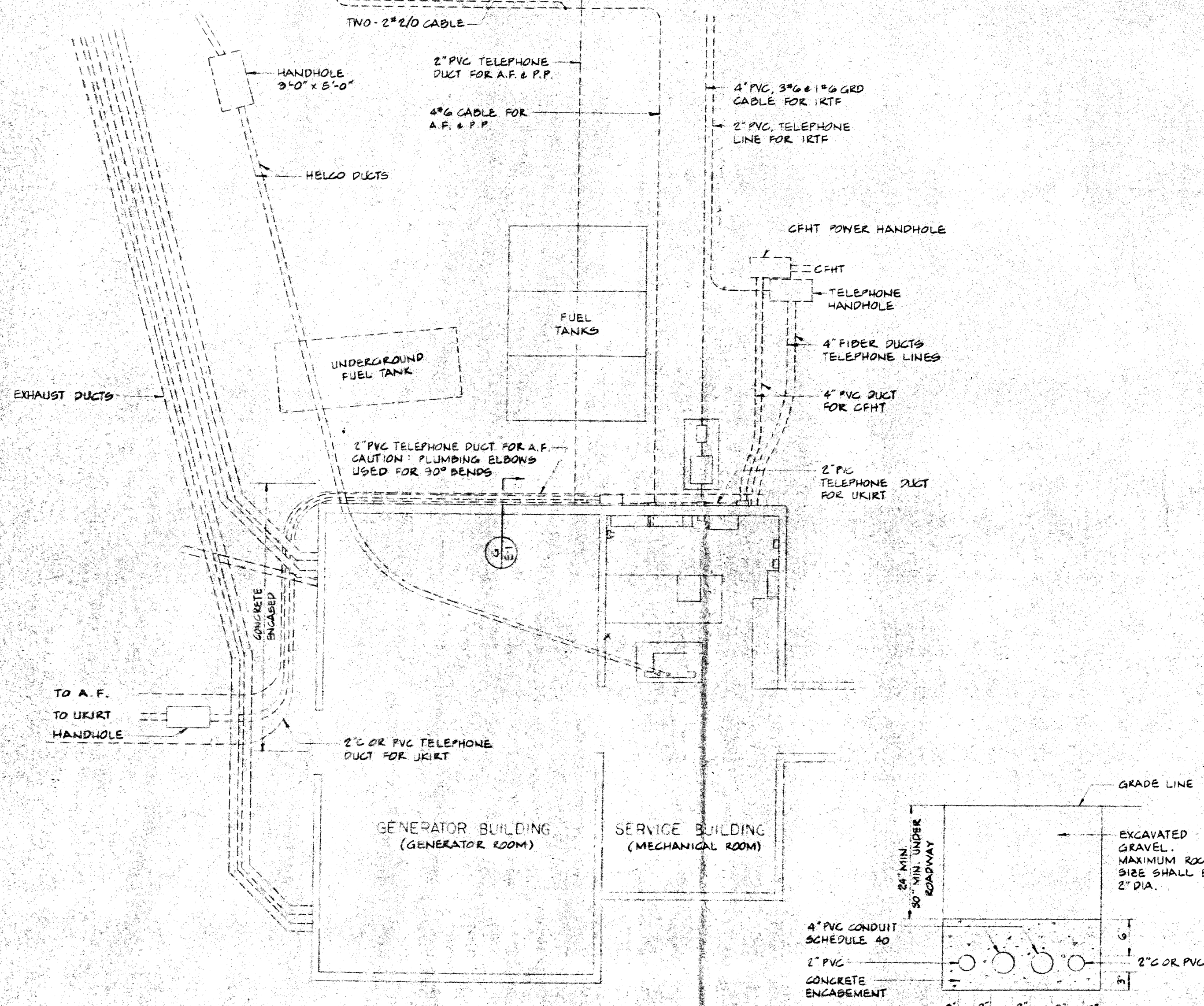
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ELECTRIC is Marked on Wall **FLOOR**
1/4" = 1' - 0"
NOTE: ONLY APPL ORIENTATI

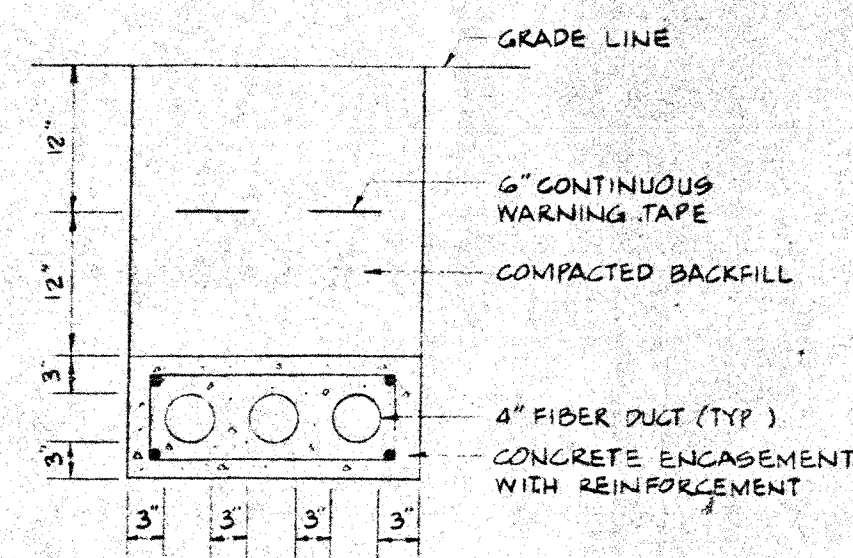
FOR REVIEW ONLY
DATE JUL 22 1998

		ELECTRICAL ADDITIONS FOR "MPI" CALTECH SUBMILLIMETER OBSERVATORY MAUNA KEA MOUNTAIN	
		CALTECH SUBMILLIMETER OBSERVATORY 111 NOWELI STREET HILO, HAWAII 98720	
		RICHARD CHAMBERLIN 935-1909/FAX:961-6273	
7/22/98	REVISION-1	WALLACE T. OKI, P.E., INC. ELECTRICAL ENGINEERING P.O. BOX 4070/688 KINOOLE ST., STE. 1158 HILO, HI. 96720 PH:961-9666/FAX:935-2549	REF. NO. 798131
DATE	ISSUE		SHT. 5 OF
			DWG. NO. E-5

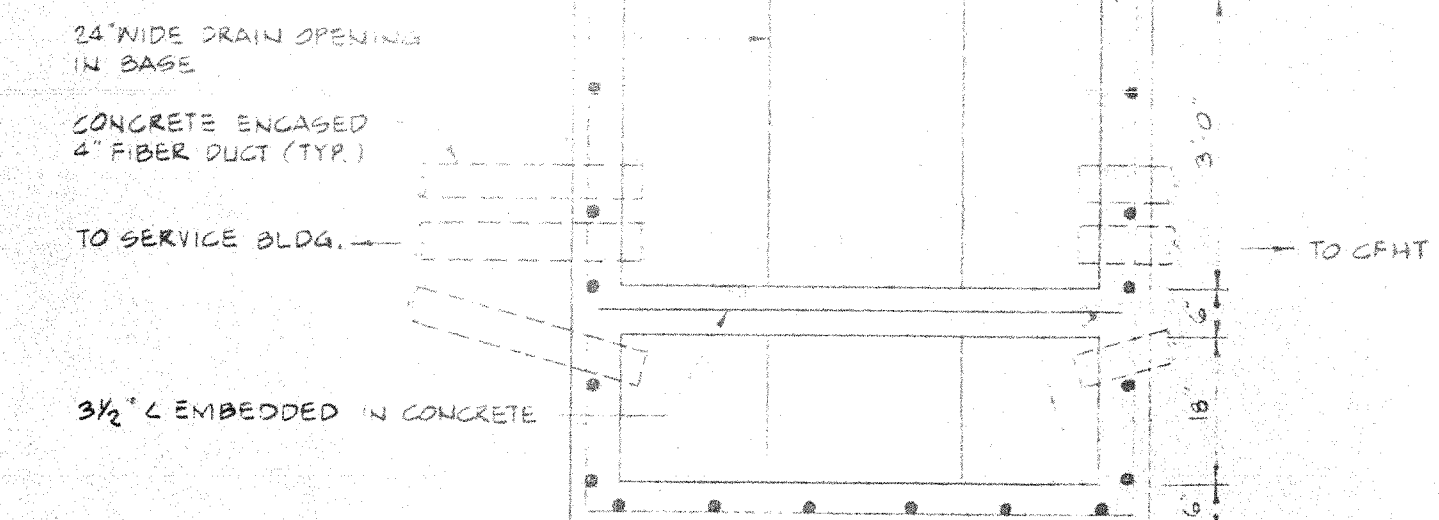


PARTIAL PLAN
1/8" = 1'-0"

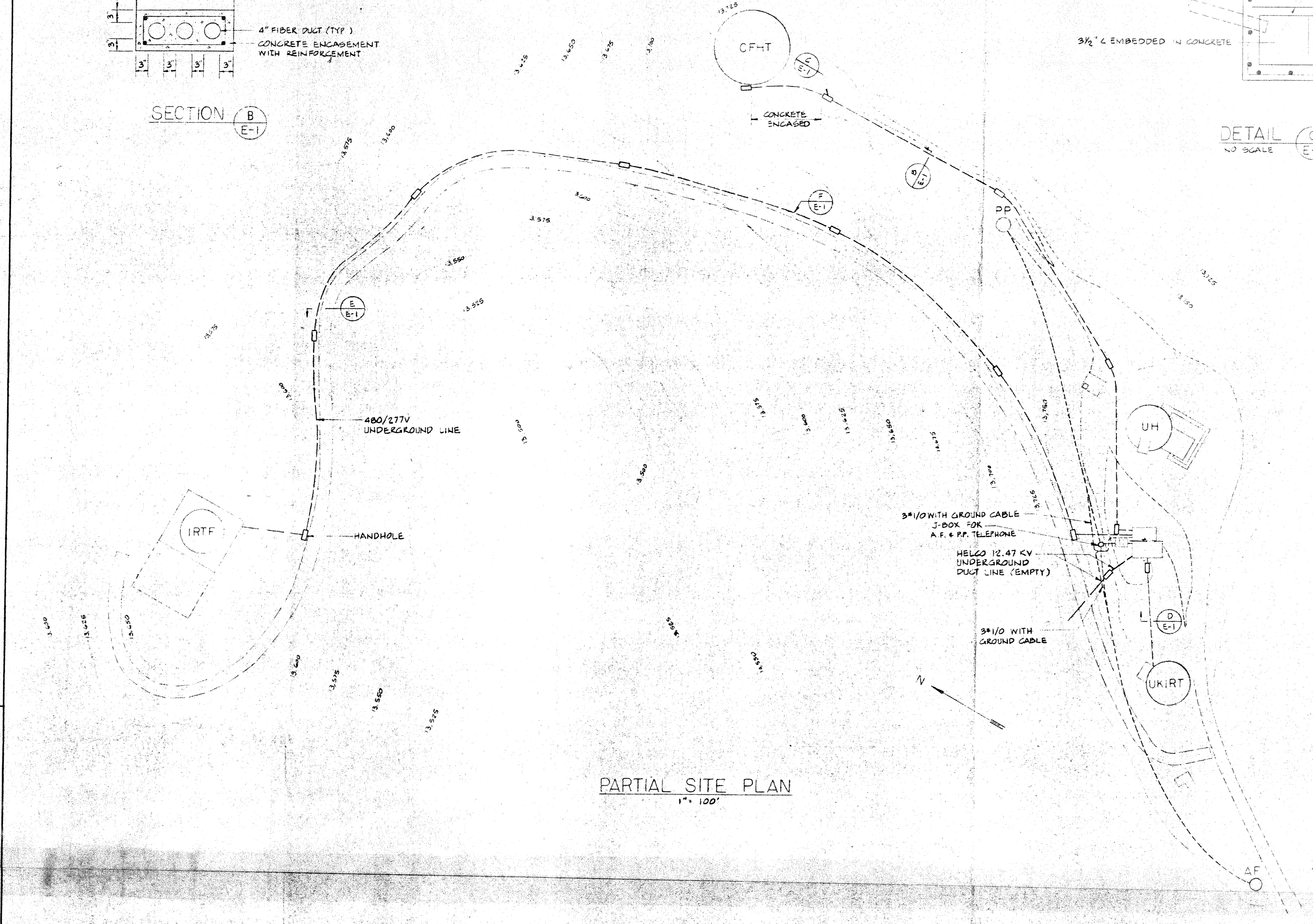
SECTION (G)
NO SCALE
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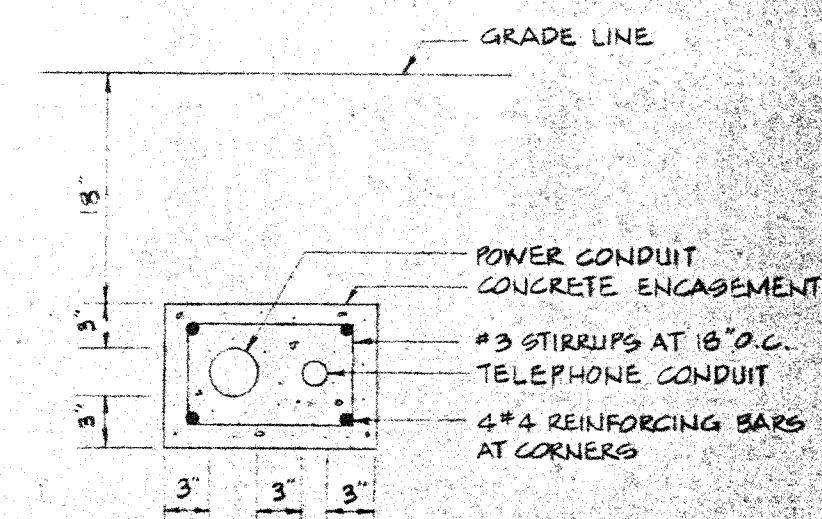
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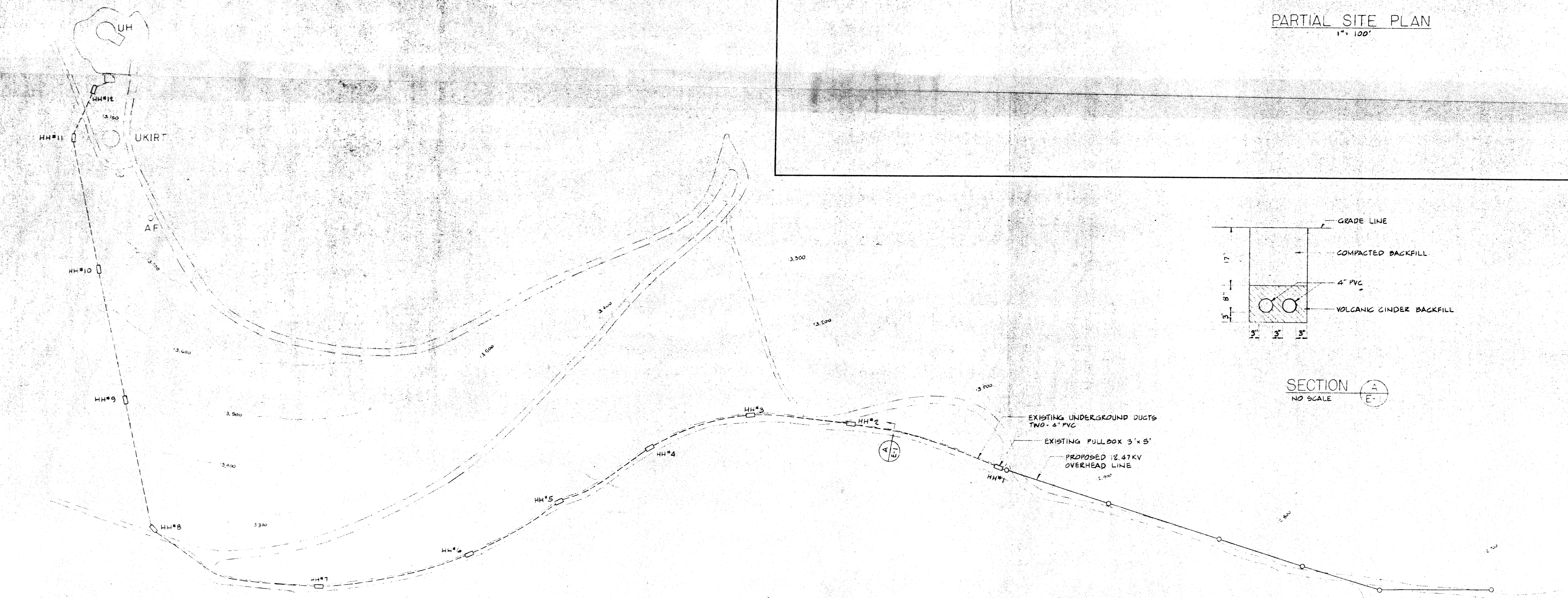
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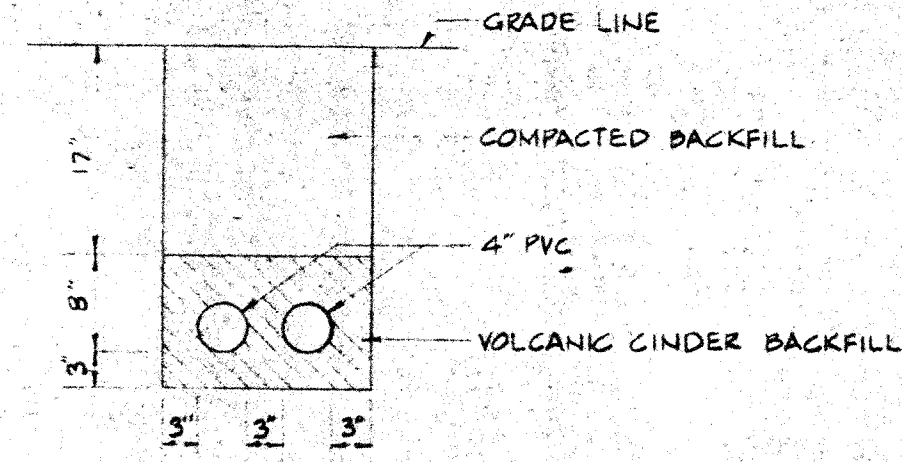
PARTIAL SITE PLAN
1" = 100'



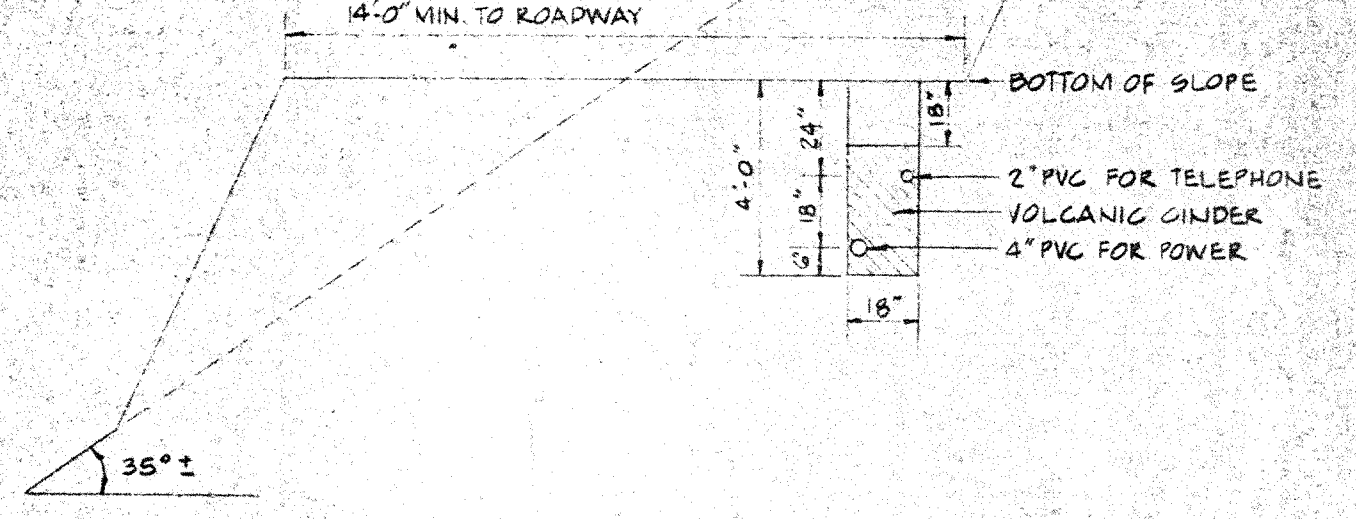
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PARTIAL SITE PLAN
1" = 200'

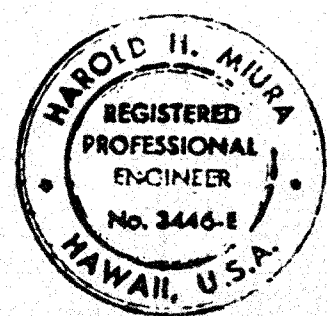


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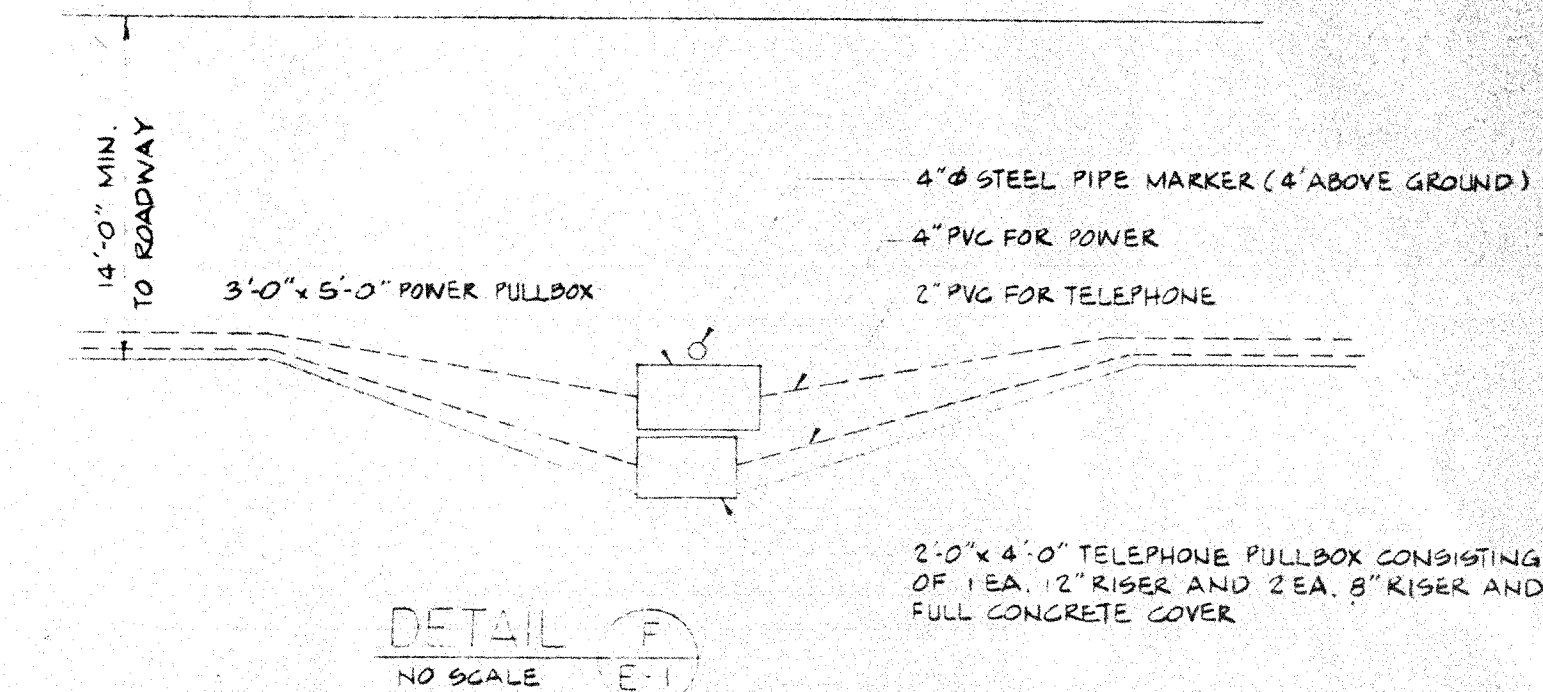
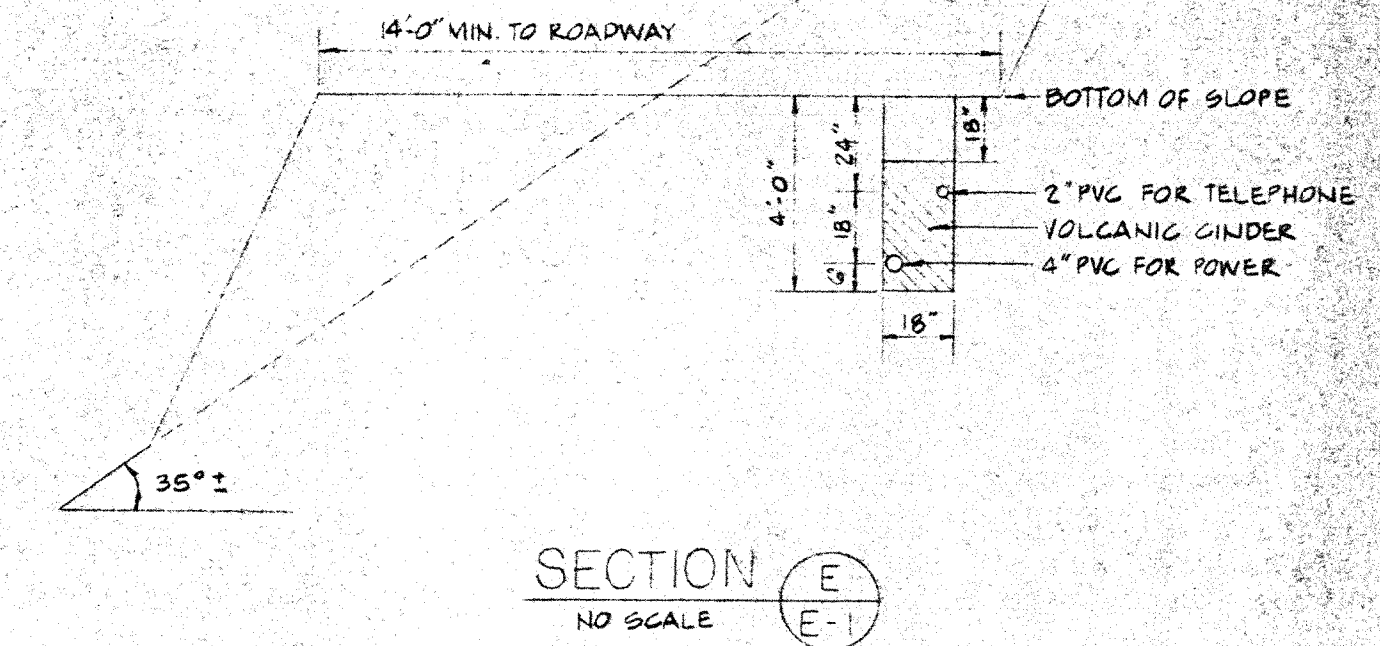
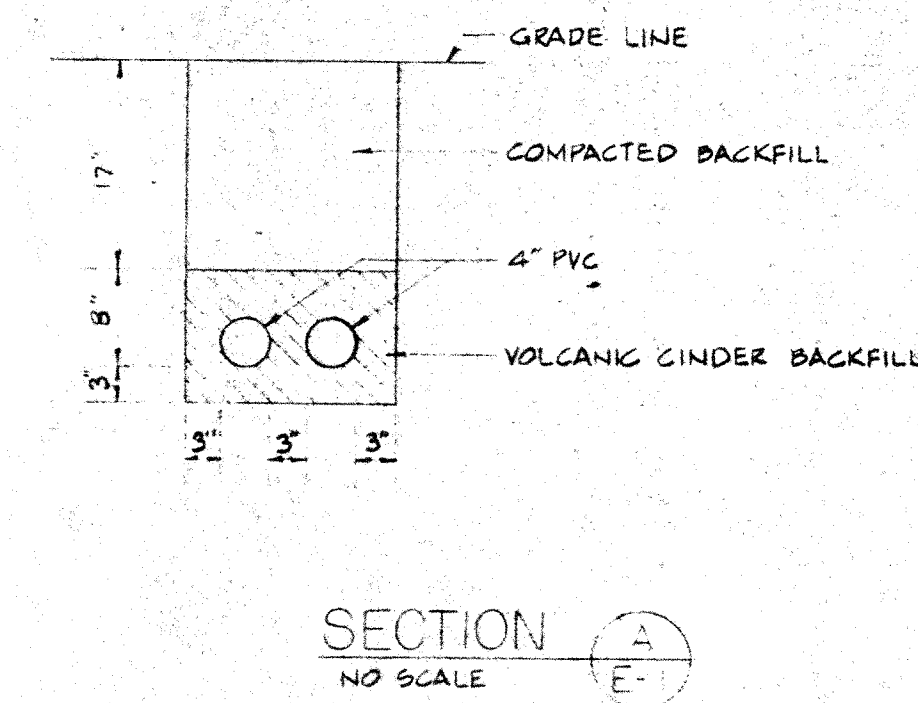
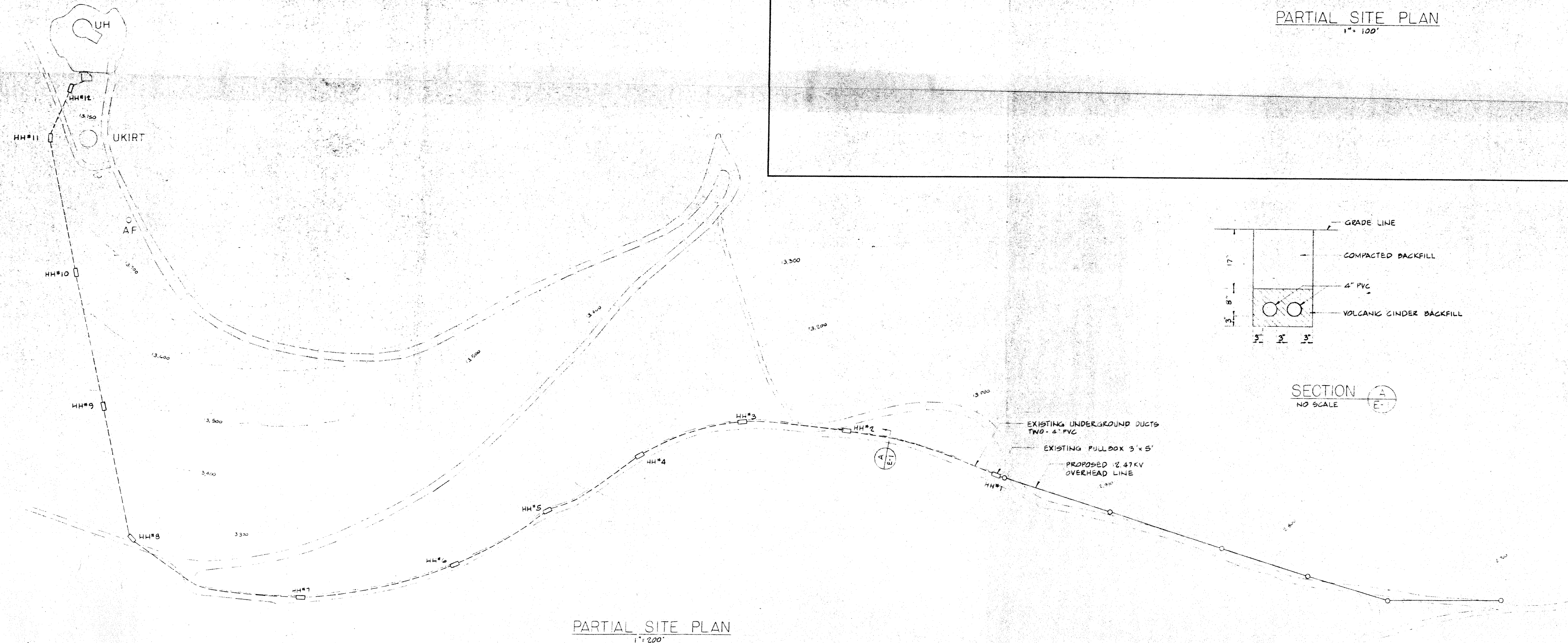
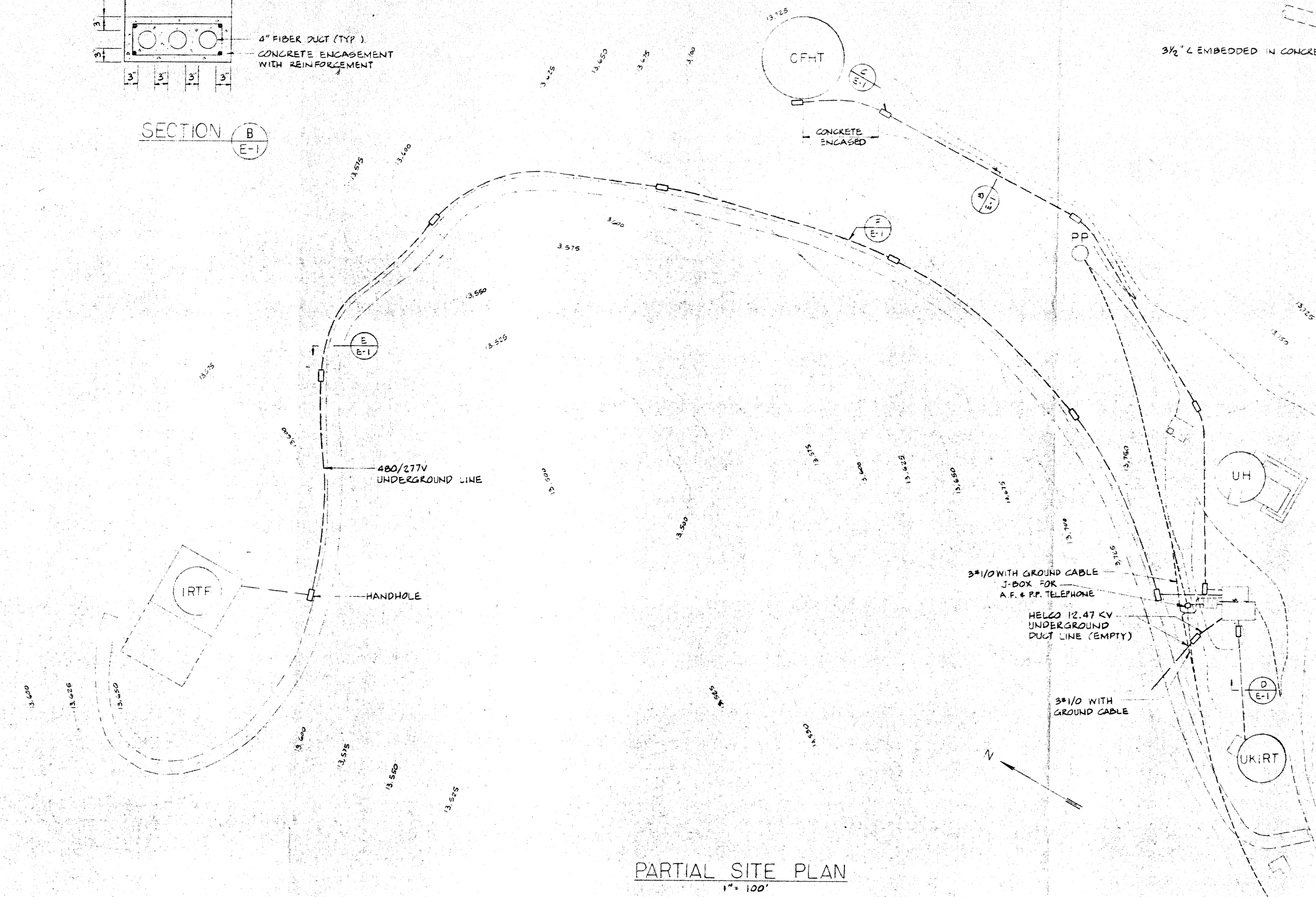
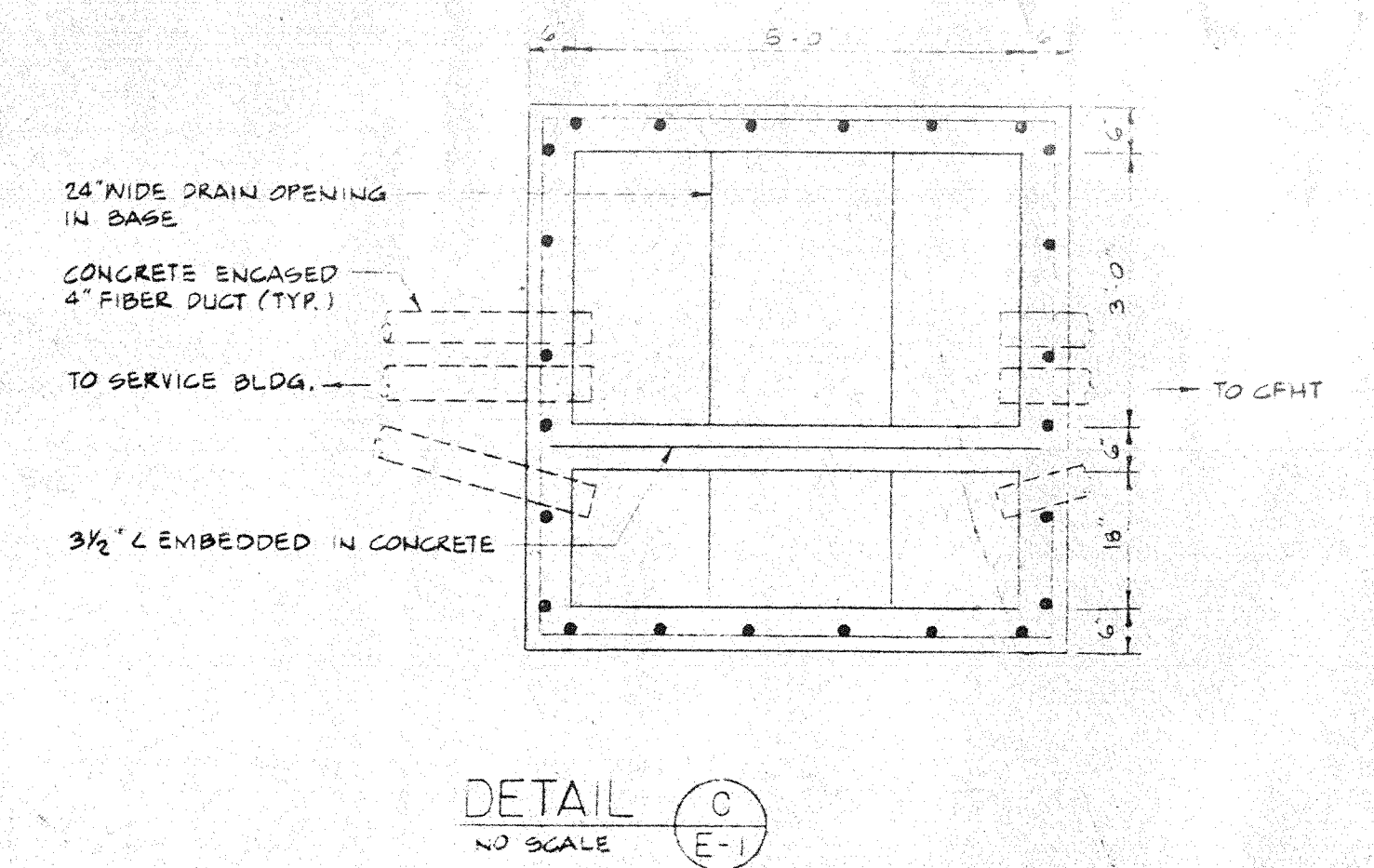
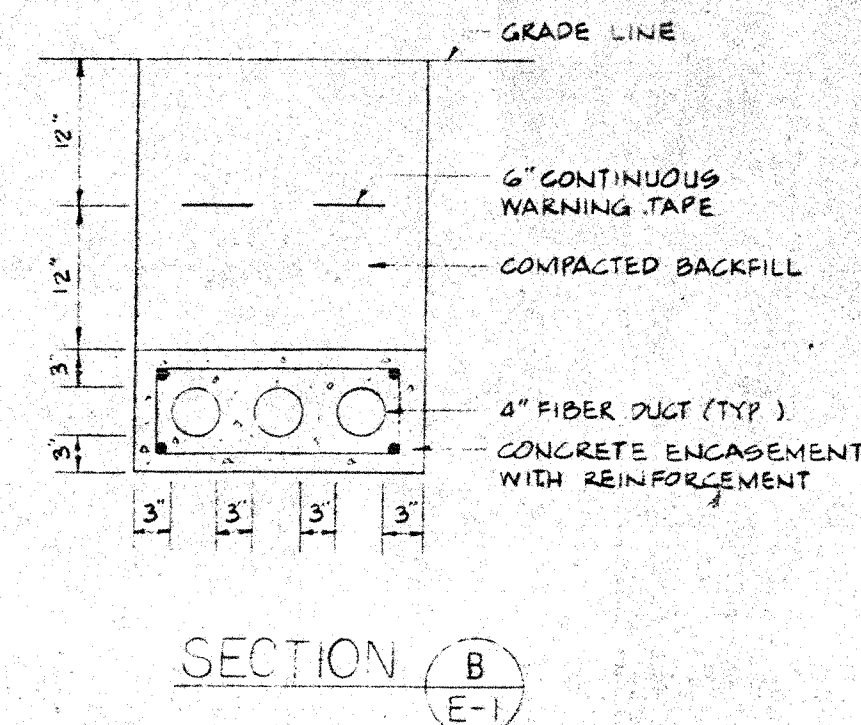
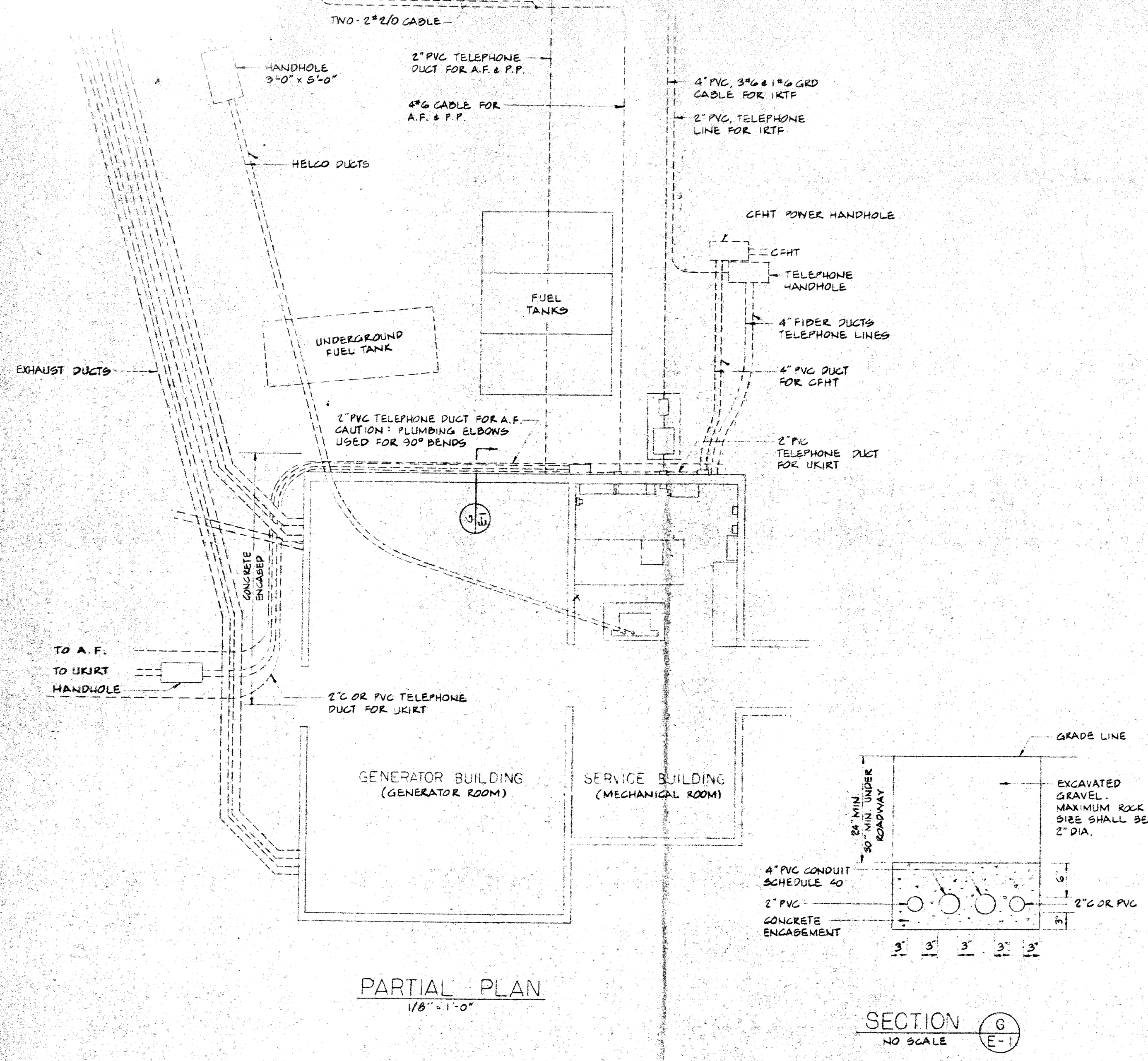
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NO.	REVISION	BY	DATE

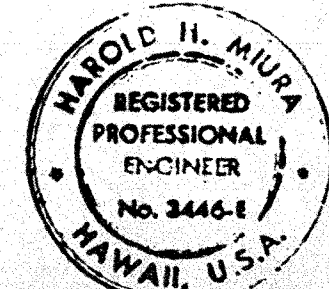


THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
Harold H. Miura

DRAWN BY: JKH	ELECTRICAL ENGINEER	HAROLD H. MIURA	RECORD NO.
CHK'D BY:	CLIENT	INSTITUTE FOR ASTRONOMY	FILE NO.
ORDER NO.	PROJECT	UTILITY DISTRIBUTION SYSTEM	SHEET 1 OF 1
APP'D BY:	TITLE	SITE & PART 2	DRAWING NO.
JOB NO.			
ACC'T NO.			
SCALE: AS SHOWN			
DATE: 1-1-13			



NO.	REVISION	BY	DATE



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Harold H. Miura

DRAWN BY: JKH	ELECTRICAL ENGINEER	HILLO - HAWAII 96720	RECORD NO.
CHK'D BY:	CLIENT	HAROLD H. MIURA	FILE NO.
ORDER NO.	PROJECT	INSTITUTE FOR ASTRONOMY	SHEET
APP'D BY:	TITLE	UTILITY DISTRIBUTION SYSTEM	OF 1
JOB NO.		SITE & PART PLAN	DRAWING NO.
ACC'T NO.			E-1
SCALE: AS SHOWN			
DATE: 8/1/83			