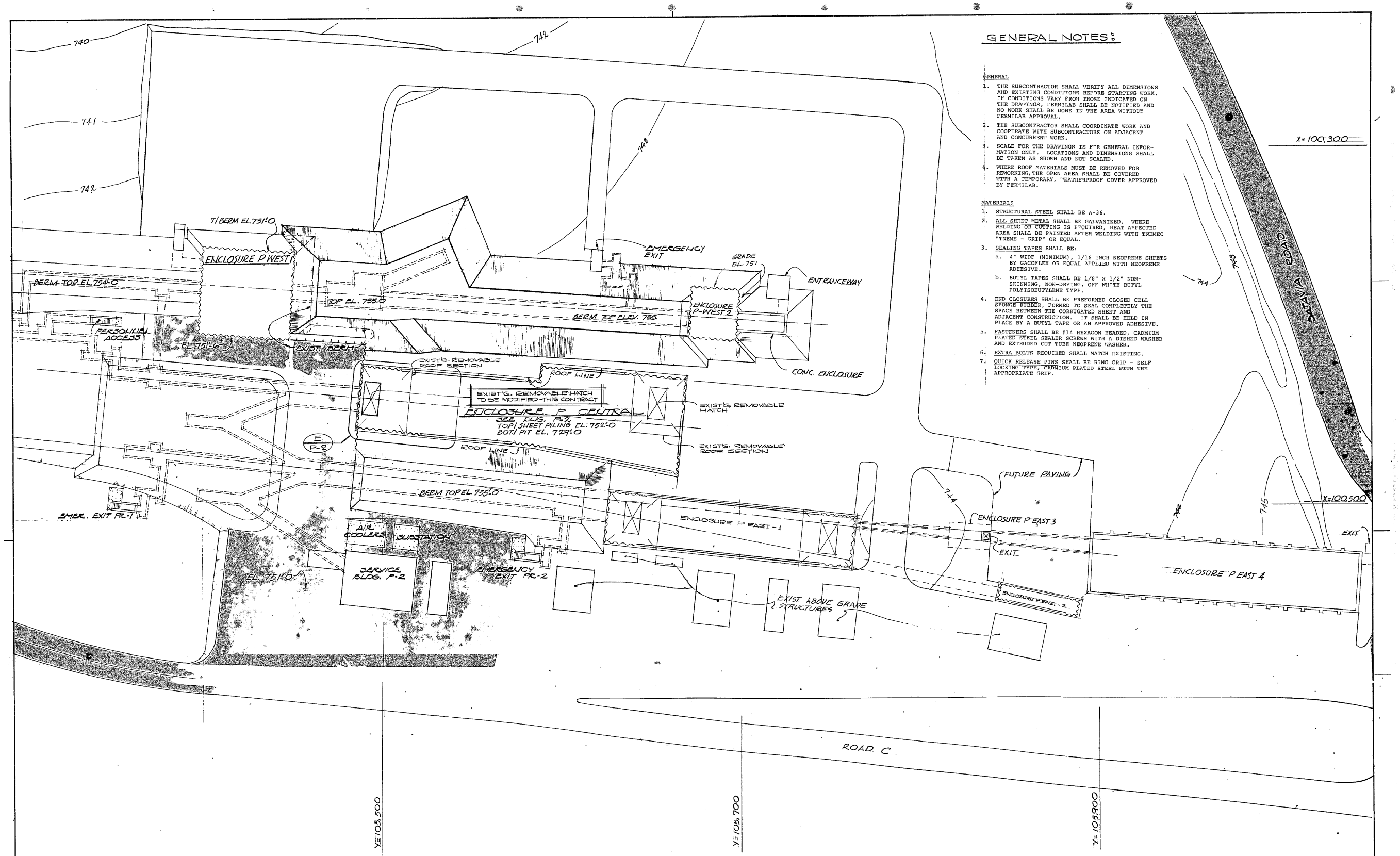
GENERAL NOTES:

GENERAL

1. THE SUBCONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS BEFORE STARTING WORK. IF CONDITIONS VARY FROM THOSE INDICATED ON THE DRAWINGS, FERMILAB SHALL BE NOTIFIED AND NO WORK SHALL BE DONE IN THE AREA WITHOUT FERMILAB APPROVAL.
2. THE SUBCONTRACTOR SHALL COORDINATE WORK AND COOPERATE WITH SUBCONTRACTORS ON ADJACENT AND CONCURRENT WORK.
3. SCALE FOR THE DRAWINGS IS FOR GENERAL INFORMATION ONLY. LOCATIONS AND DIMENSIONS SHALL BE TAKEN AS SHOWN AND NOT SCALED.
4. WHERE ROOF MATERIALS MUST BE REMOVED FOR REWORKING, THE OPEN AREA SHALL BE COVERED WITH A TEMPORARY, "WEATHERPROOF COVER APPROVED BY FERMILAB.

MATERIALS

1. STRUCTURAL STEEL SHALL BE A-36.
2. ALL SHEET METAL SHALL BE GALVANIZED. WHERE WELDING OR CUTTING IS REQUIRED, HEAT AFFECTED AREA SHALL BE PAINTED AFTER WELDING WITH TNEMEC "TNEME - GRIP" OR EQUAL.
3. SEALING TAPES SHALL BE:
   a. 4" WIDE (MINIMUM), 1/16 INCH NEOPRENE SHEETS BY GACOFLEX OR EQUAL APPLIED WITH NEOPRENE ADHESIVE.
   b. BUTYL TAPES SHALL BE 1/8" x 1/2" NON-SKINNING, NON-DRYING, OFF WHITE BUTYL POLYISOBUTYLENE TYPE.
4. END CLOSURES SHALL BE PREFORMED CLOSED CELL SPONGE RUBBER, FORMED TO SEAL COMPLETELY THE SPACE BETWEEN THE CORRUGATED SHEET AND ADJACENT CONSTRUCTION. IT SHALL BE HELD IN PLACE BY A BUTYL TAPE OR AN APPROVED ADHESIVE.
5. FASTENERS SHALL BE #14 HEXAGON HEADED, CADMIUM PLATED STEEL SEALER SCREWS WITH A DISHED WASHER AND EXTRUDED CUP TYPE NEOPRENE WASHER.
6. EXTRA BOLTS REQUIRED SHALL MATCH EXISTING.
7. QUICK RELEASE PINS SHALL BE RING GRIP - SELF LOCKING TYPE, CADMIUM PLATED STEEL WITH THE APPROPRIATE GRIP.



LOCATION PLAN
1" = 20:0

SCALE IN FEET: 20 0 20 40 60 80

PROJECT NORTH (N, W, S, E)

AREA IN THIS CONTRACT INDICATED THUS :

DESIGNED	E. MAJOR	DATE
DRAWN	J.T. HACKEMER	
CHECKED		
SUBMITTED		4/25/75
NAL RELEASE		4/25/75

REV. NO.	DATE	DESCRIPTION
		REVISIONS

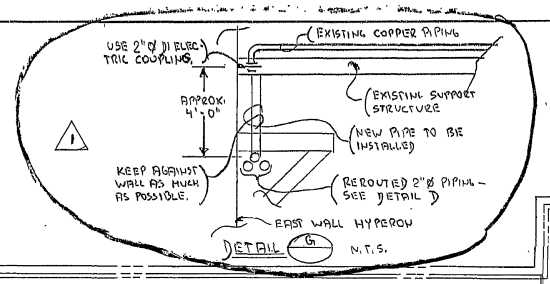
NATIONAL ACCELERATOR LABORATORY
U. S. ATOMIC ENERGY COMMISSION

TITLE: PROTON LABORATORY
P-CENTRAL ROOF HATCH MODIFICATIONS
LOCATION PLAN & GENERAL NOTES

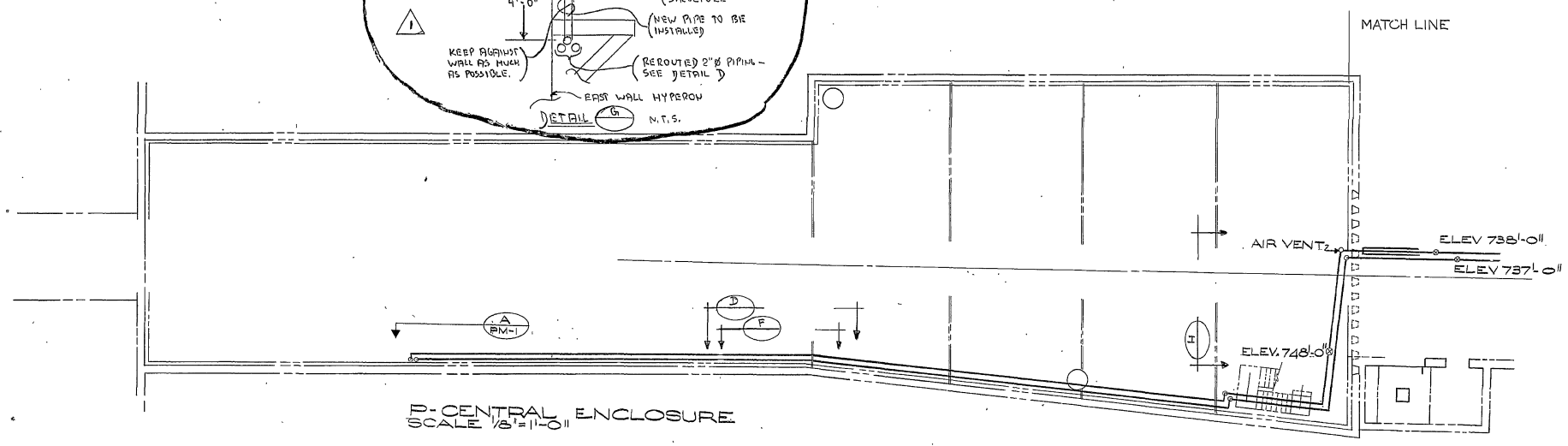
DRAWING NO. 8-4-34 P-1 REV.

APRIL 25, 1975

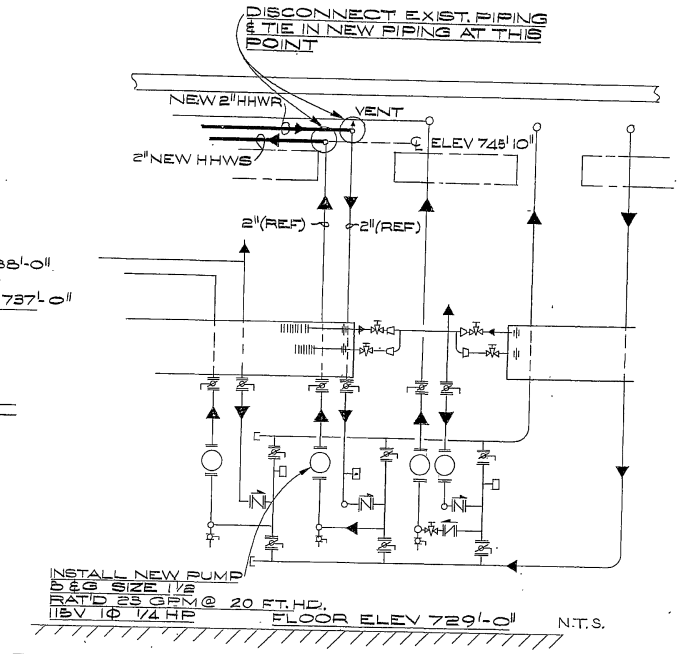
FF 91

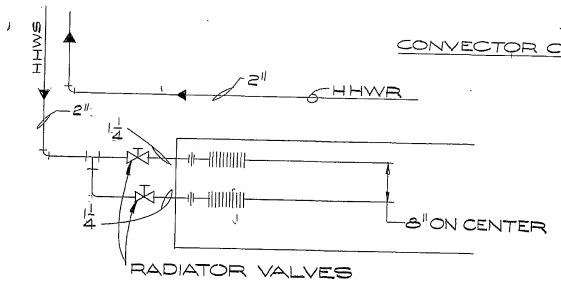


DETAIL G N.T.S.

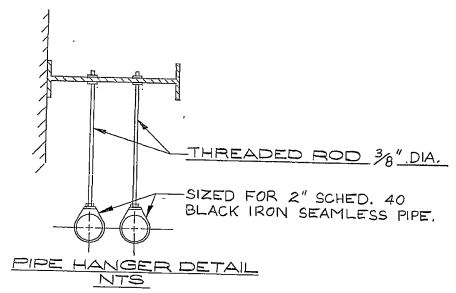


P-CENTRAL ENCLOSURE
SCALE 1/8"=1'-0"

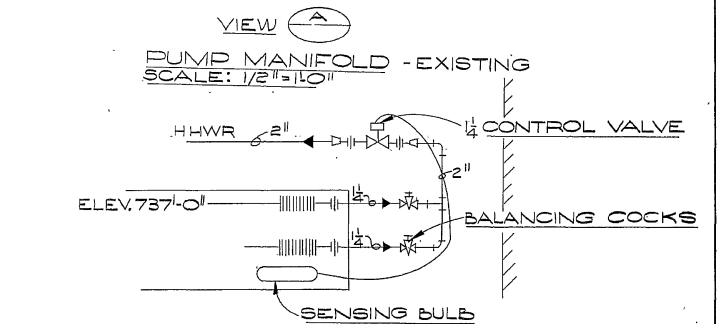




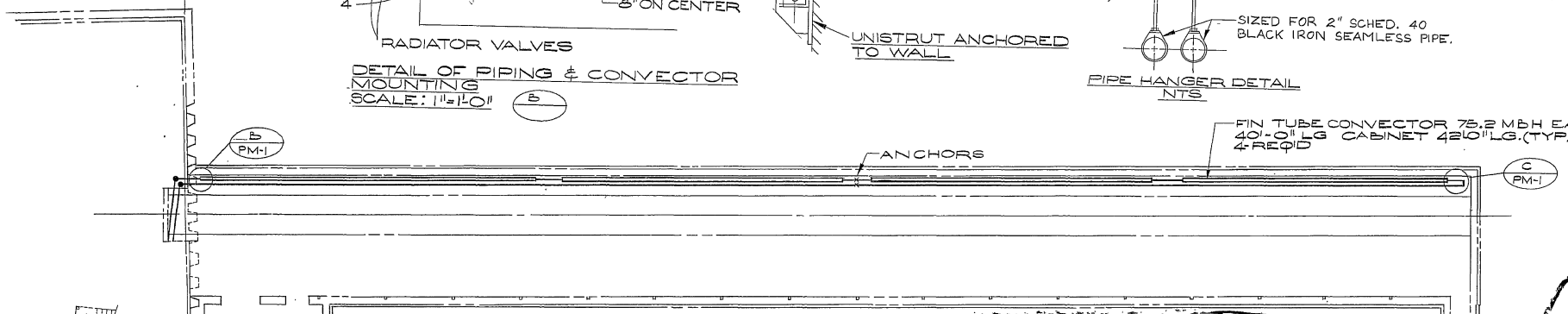
DETAIL OF PIPING & CONVECTOR MOUNTING
SCALE: 1"=1'-0" B



PIPE HANGER DETAIL
NTS

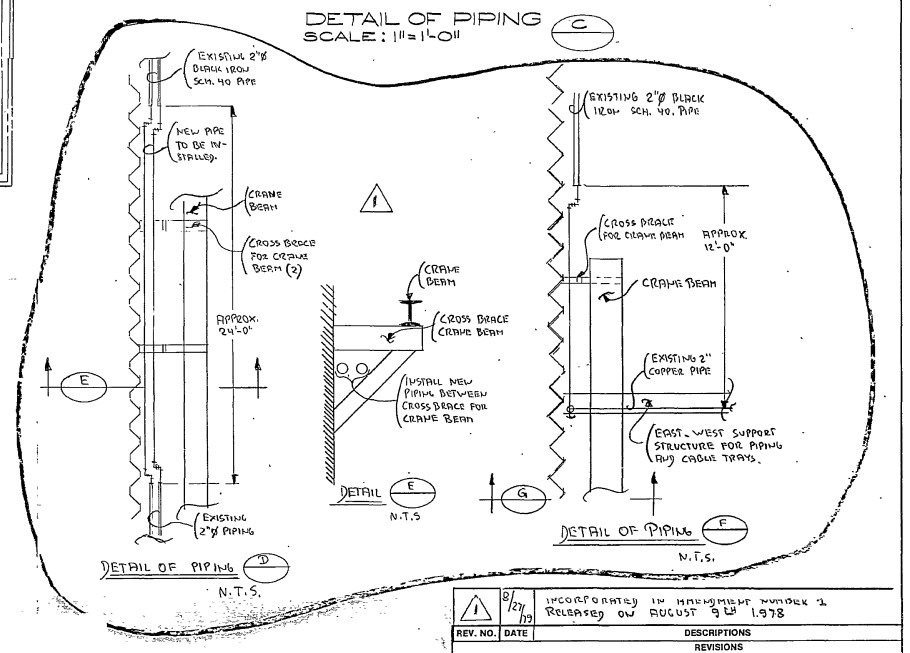


PUMP MANIFOLD - EXISTING
SCALE: 1/2"=1'-0"



HYPERON BEAM ENCLOSURE
SCALE 1/8"=1'-0"

DETAIL H N.T.S.



DETAIL OF PIPING
SCALE: 1"=1'-0"

DETAIL OF PIPING D N.T.S.

DETAIL E N.T.S

DETAIL OF PIPING F N.T.S.

SPECIFICATIONS AND NOTES

1. SCOPE: THE SUBCONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT AND SERVICES NECESSARY TO INSTALL HOT WATER CONVECTOR SYSTEM FOR HYPERON ENCLOSURE AS SHOWN ON THE DRAWING AND SPECIFIED HEREIN AFTER.
   - A. FURNISH AND INSTALL WHERE INDICATED ON DRAWING FIN TUBE CONVECTORS COMPLETE WITH ENCLOSURES.
   - B. FURNISH AND INSTALL COMPLETE PIPING SYSTEM AS INDICATED ON DRAWINGS INCLUDING VALVES, HANGERS, FITTINGS, CONTROL VALVE, AND AIR VENTS.
   - C. FURNISH AND INSTALL PUMP REPLACING EXISTING PUMP.
   - D. FILL, BLEED AND TEST SYSTEM.
2. GENERAL: ALL WORK UNDER THIS SUBCONTRACT IS SUBJECT TO THE TERMS AND CONDITIONS - FERMILAB CONSTRUCTION SUBCONTRACT.
3. MATERIALS:
   - A. HOT WATER PIPING SHALL BE SCHEDULE 40 BLACK CARBON STEEL, SEAMLESS OR WELDED SEAMS, ASTM A-120. ALL FITTINGS, JOINTS, VALVES, ETC., SHALL BE 125/150 PSI WP.
4. INSTALLATION DETAILS.
   - A. INSTALL ALL PIPING STRAIGHT, TRUE, PLUMB AND PARALLEL TO THE BUILDING LINE WHERE POSSIBLE. SUPPORT INDEPENDENTLY OF CONNECTIONS.
   - B. PIPING 1½" AND SMALLER SCREWED JOINTS WITH UNIONS WHERE INDICATED. LOCATE UNIONS BETWEEN SHUT-OFF VALVES AND EQUIPMENT.
   - C. PIPING 2" AND OVER SHALL BE WELDED. MITERING OF PIPE OR USE OF FIELD FABRICATED WELDING FITTINGS NOT PERMITTED.
   - D. EXPANSION: MAKE PROVISION FOR EXPANSION AND CONTRACTION IN ALL PARTS OF PIPING SYSTEM WHEREVER POSSIBLE BY MEANS OF PIPE BENDS, PIPE LOOPS, SWING CONNECTIONS OR CHANGES IN DIRECTION OF PIPING.
5. EQUIPMENT:
   - A. PUMP SHALL BE SIMILAR TO BELL & GOSSETT IN-LINE OR APPROVED EQUAL. RATINGS AS INDICATED.
   - B. FINNED TUBE CONVECTORS SHALL BE AS MANUFACTURED BY TRANE, VULCAN RADIATOR CO., HERSHER WALVECTOR, OR APPROVED EQUAL OF TYPE, SIZE, ARRANGEMENT AND CAPACITY AS INDICATED ON THE DRAWINGS AND HEREINAFTER SPECIFIED.
     - a. FINNED ELEMENTS SHALL BE OF ALUMINUM FINS, PERMANENTLY EMBEDDED INTO A SEAMLESS COPPER TUBE AND SHALL BE DESIGNED FOR THE SAME WORKING PRESSURE AS ADJOINING PIPING.
     - b. BRACKETS AND SADDLES SHALL BE SPACED AT NOT MORE THAN 4'-0" ON CENTER AND SO ARRANGED AS TO PROVIDE A PROPER PITCH AND COMPENSATE FOR EXPANSION OF PIPE.
     - c. ENCLOSURE SHALL BE TYPE S, SLOPING TOP OUTLET, WITH CONTINUOUS STAMPED METAL GRILLE, FINISHED IN BAKED ENAMEL PRIME. ENCLOSURE SHALL BE OF 14 GAUGE STEEL AND LOCK INTO THE MOUNTING STRIP AT THE TOP AND INTO THE ENCLOSURE BRACKET AT THE BOTTOM WITHOUT VISIBLE FASTENERS. WHENEVER FIN TUBE CONVECTORS ARE ABOVE EYE LEVEL, INVERT ENCLOSURE. CONVECTORS SHALL BE SECURED TO WALL WITH EXPANSION BOLTS OR OTHER APPROVED METHOD. COMPLETE WITH ACCESSORIES WHERE NEEDED SUCH AS END PANELS, INSIDE AND OUTSIDE CORNERS, ENCLOSURE EXTENSIONS.
     - d. ALL STEEL COMPONENTS SHALL BE PRIMED TO PREVENT CORROSION.
   - C. ZONE CONTROL VALVE SHALL BE PROVIDED AT END OF CONVECTOR LOOP AS INDICATED ON DRAWING, SIMILAR TO DANFOSS TYPE RA-96 1½" ANGLE OR STRAIGHT PATTERN, ONE SIDE UNION, BRONZE CONSTRUCTION COMPOSITION DISC PACKLESS VALVE BRONZE BELLOWS, COMPLETE WITH CONTROL HEAD FOR WALL MOUNTING AND 9'-0" CAPILLARY. INCLUDE BULB GUARD.
   - D. RADIATOR VALVES AT SUPPLY END OF CONVECTOR LOOP, AS INDICATED ON THE DRAWING, MANUALLY OPERATED VALVE SIMILAR TO BARCO #1239 GLOBE MODULATING, OR ILLINOIS SERIES 65.
   - E. BALANCING COCKS AT RETURN END OF EACH LOOP 125 PSI WSP CLASS, SQUARE HEAD TYPE SIMILAR TO AAF ILLINOIS PRODUCTS IN FIGURE NUMBERS INDICATED.
     - a. UP TO 1½" BRONZE, SCREWED OR SWEAT, SERIES 4000.
   - F. AIR VENTS SHALL BE PROVIDED THROUGHOUT THE HOT WATER PIPING SYSTEM AS INDICATED, SPECIFIED OR REQUIRED TO VENT COMPLETELY THE PIPING SYSTEM. PROVIDE CAMBE #57 OR EQUAL 300 LB. WSP BRONZE NEEDLE VALVES WITH SHORT LENGTH OF TUBING TURNED DOWN FOR DISCHARGE INTO BUCKET.
   - G. HANGERS AND ANCHORS:
     - a. FURNISH AND INSTALL ALL NECESSARY PIPE HANGERS, EQUIPMENT SUPPORTS OR HANGERS, WHICH SHALL INCLUDE ALL STRUCTURAL STEEL MEMBERS AND SHAPES, STANDARD RODS, NUTS, BOLTS, CONCRETE INSERTS, EXPANSION SHIELDS, WELDING PINS, BEAM CLAMPS, PIPE BRACKETS, TUBING AND PIPE CLAMPS, AS INDICATED ON THE DRAWING, HEREINAFTER SPECIFIED, OR AS REQUIRED TO SUPPORT AND/OR SUSPEND ALL EQUIPMENT, PIPING AND DUCTWORK. PIPE DUCT AND EQUIPMENT SUPPORTS AND HANGERS, AS MANUFACTURED BY CRANFORD, GRINNELL OR APPROVED EQUAL OF THE SPECIFIED ELCH ARE ACCEPTABLE.
     - b. ANCHOR HORIZONTAL PIPING WHERE INDICATED AND WHEREVER NECESSARY TO LOCALIZE EXPANSION OR PREVENT UNDUE STRAIN ON BRANCHES. ANCHORS: HEAVY FORGED CONSTRUCTION, ENTIRELY SEPARATE FROM SUPPORTS.
     - c. ANCHOR VERTICAL PIPING WHEREVER INDICATED OR NECESSARY TO PREVENT UNDUE STRAINS ON OFFSETS AND BRANCHES. ANCHORS, UNLESS OTHERWISE NOTED: HEAVY STEEL CLAMPS SECURELY BOLTED AND WELDED TO PIPES. EXTENSION ENDS SHALL BEAR ON BUILDING CONSTRUCTION.
     - d. FURNISH ANY ADDITIONAL STRUCTURAL STEEL THAT MAY BE REQUIRED FOR PROPER INSTALLATION OF HANGERS, ANCHORS, GUIDES AND SUPPORTS.
   - H. PIPE HANGER RODS, UNLESS OTHERWISE SPECIFIED OR INDICATED, SHALL BE OF HOT DRAWN THREADED STEEL RODS OF THE FOLLOWING MINIMUM SIZES:

PIPE SIZE	HANGER ROD DIAMETER
UP THROUGH 2"	3/8" SINGLE ROD

6. CLEANING OF PIPING SYSTEMS:
   - A. WHEN DIRECTED OR BEFORE EACH SYSTEM IS ACCEPTED BY FERMILAB, FOR ITS OPERATION, PERFORM THE SERVICES AND WORK HEREINAFTER SPECIFIED:
     - a. HOT WATER PIPING: ALL PIPING SHALL BE THOROUGHLY FLUSHED OUT WITH WATER TO REMOVE ANY FOREIGN MATTER THAT CAN BE REMOVED BY FLUSHING. COMPLETELY DRAIN PIPING.
7. TESTING AND BALANCING:
   - A. PIPING SYSTEMS: AFTER FLUSHING PIPES, FILL ALL SYSTEMS AND SUBJECT TO STATIC PRESSURE TESTS OF 100 PSI, SUSTAINED WITH NO NOTICEABLE LOSS OF PRESSURE FOR A PERIOD OF AT LEAST 24 HOURS. PRIOR TO TEST, REMOVE OR PROTECT ANY COMPONENTS THAT MIGHT BE DAMAGED BY THE TEST PRESSURE. DEMONSTRATE THAT ALL WATER PASSAGES ARE FREE FROM OBSTRUCTIONS, AND STOP VALVES AND CONTROLS WILL PERFORM AS INTENDED. PERFORM TESTS IN THE PRESENCE OF THE FERMILAB INSPECTOR.

REV. NO.	DATE	DESCRIPTIONS
1	8/27/79	INCORPORATED IN MINIMUM ORDER 2 Released on August 13 1978

REVISIONS

DESIGNED	J. D. RACZEK / F. RUECH	10-04-78 06-01-79
DRAWN		10-04-78 06-07-79
CHECKED	J. D. Raczek / F. RUECH	06-07-79
APPROVED	M. WARNER	
SUBMITTED		

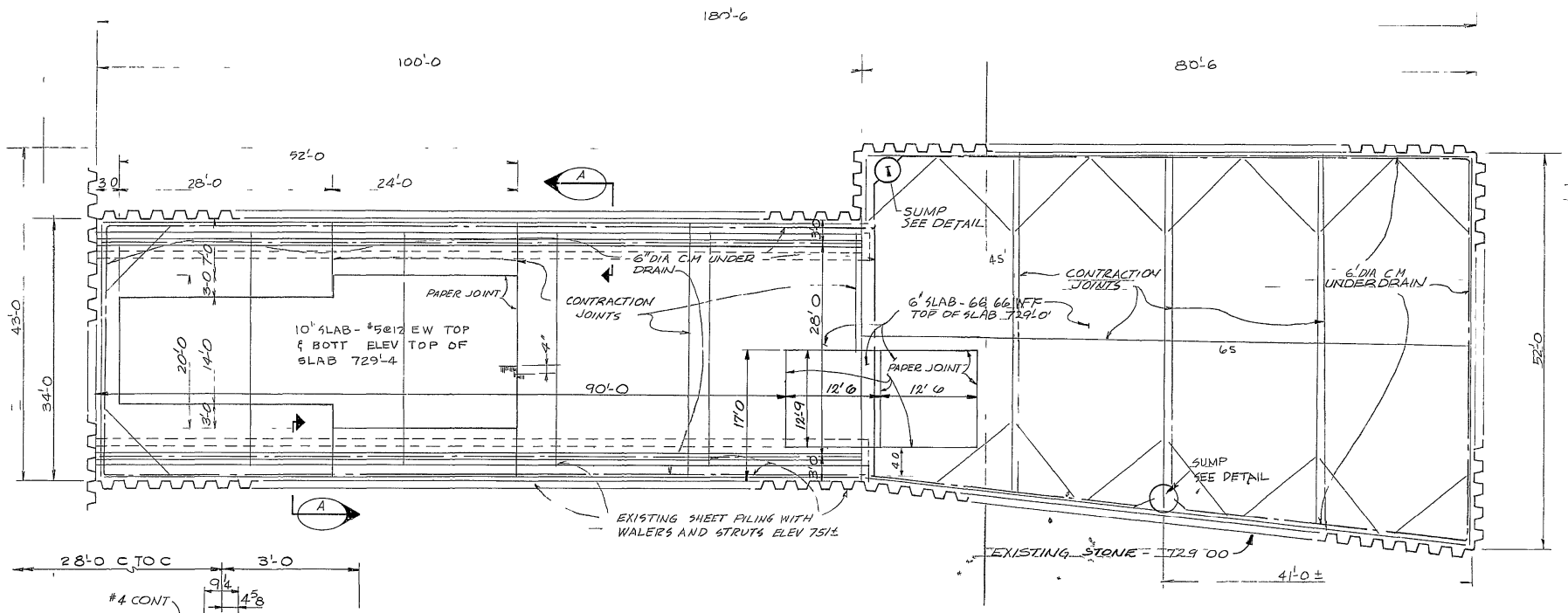
FERMI NATIONAL ACCELERATOR LABORATORY
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

HYPERON HEATING

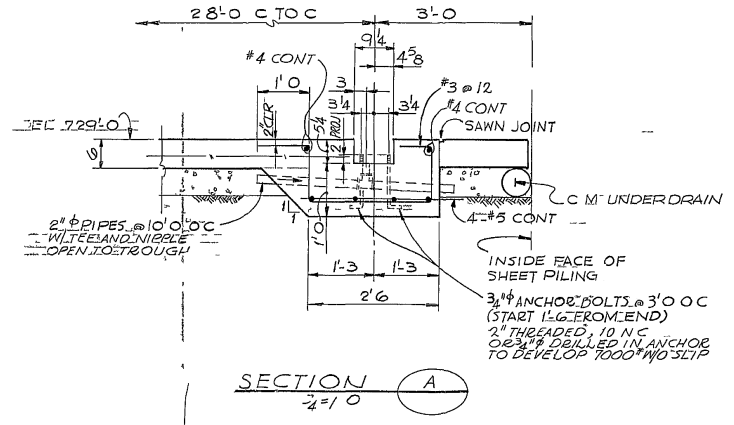
DRAWING NO. 8-4-51 PM-1 REV.

AUGUST 27/1979

FF 92



PLAN - P CENTRAL
SCALE 1/8"=1'-0



SECTION A
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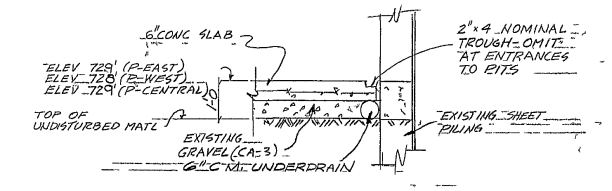
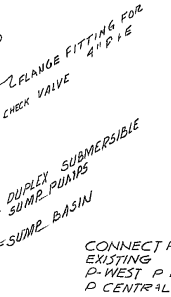
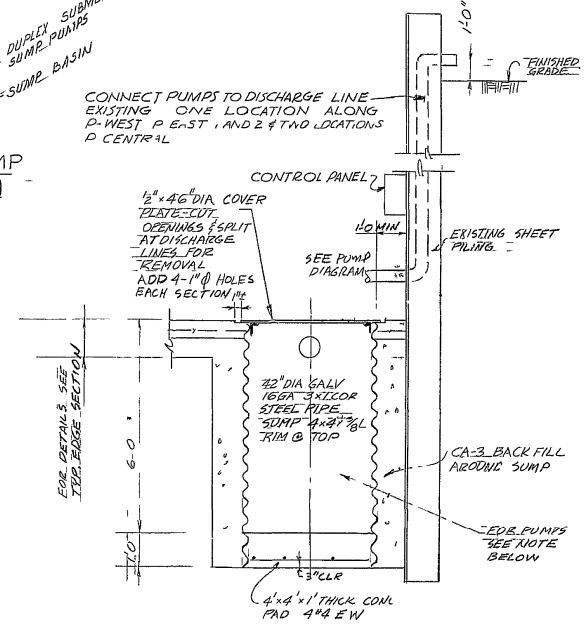


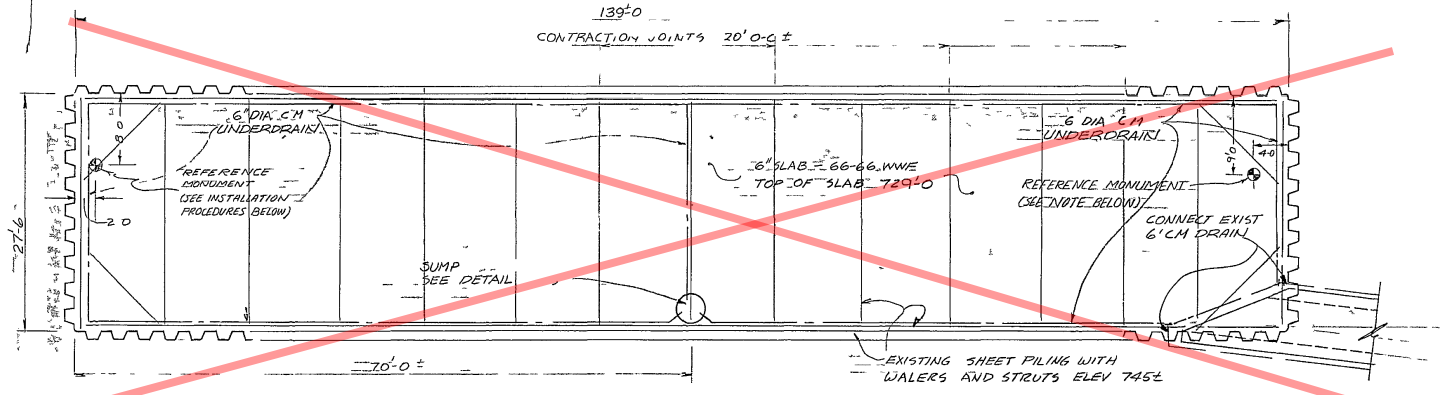
TYPICAL EDGE SECTION
NTS



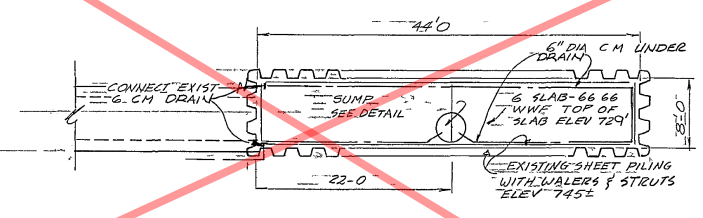
SUMP PUMP DIAGRAM
NO SCALE



SUMP DETAILS
NTS



PLAN - P EAST (1)
SCALE 1/8"=1'-0



PLAN - P EAST (2)
SCALE 1/8"=1'-0

REFERENCE MONUMENT INSTALLATION PROCEDURE

EXCAVATE & INSTALL 8 ϕ X 5-0 LONG OPEN PIPE CASING (T/CASING AT ELEV 728.0') BACKFILL AND POUR SLAB AROUND CASING DRIVE 3 ϕ X I S D (3 5 0 SEGMENTS) PIPE INSIDE CASING FILL 3 ϕ WITH GROUT FILL SPACE BETWEEN 3 ϕ PIPE & CASING WITH STYROFOAM PELLETS

FURNISH AND INSTALL HYDR-O-MATIC OR OTHER APPROVED DUPLEX, MODEL SP-100AH3-4 SUBMERSIBLE SUMP PUMP EACH PUMP SHALL BE CAPABLE OF DISCHARGING 40 GPM @ 50 FOOT T DH WITH 1 H P 480 VOLT 3 PHASE 60 HERTZ MOTOR CONTROL OF PUMPS SHALL BE WITH HYDR-O-MATIC #3900 MERCURY SWITCH LEVEL CONTROLS

PROVIDE CONTROLS MOUNTED IN NEMA 4 ENCLOSURE
CONTROLS SHALL INCLUDE
1 100/15-3P 480V COMBINATION FVNR STARTERS CIRCUIT BREAKER TYPE WITH 3 PHASE OVERLOAD PROTECTION AND H-O-A SWITCH WITH RED RUNNING LIGHT AND MIN 75VA CONTROL TRANSFORMER FOR EACH PUMP CIRCUIT BREAKERS MIN INTERRUPTING CAPACITY TO BE 25000A SYMMETRICAL
2 AN ELECTRIC ALTERNATOR
3 HIGH WATER ALARM BELL MOUNTED IN SEPARATE NEMA BOX FOR 120V OPERATION

POWER FOR PUMPS WILL BE PROVIDED BY OTHERS

4 0 4 8 12 16 20
1/8 = 1 0

1 0 1 2 3
3/4 = 1 0.

CONTRACTION JOINTS SHALL BE A MIN OF 2" DEEP 1/8" WIDE THEY SHALL BE FILLED WITH METAL, PLASTIC OR POLYVINLY FILLER.
CONCRETE f'c = 4000 PSI, 3/4" MAX AGGREGATE.
REINFORCING ASTM A 615 GR 60 GRADE 60
WELDED WIRE FABRIC ASTM A 185 GR

DANIEL URBAHN SEELYE & FULLER
ARCHITECTURE ENGINEERING CONSTRUCTION MANAGEMENT

DESIGNED	RE PAGES	DATE
DRAWN	RE PAGES	4/19/72
CHECKED	T DAWLAK	4/19/72
SUBMITTED		4/19/72
NAL RELEASE		4/19/72

REV NO	DATE	DESCRIPTION
	4-74	AS BUILT
5A13	5287A	SUPPLEMENTAL AGREEMENT TO C & I B ON NO C 1558

REVISIONS

NATIONAL ACCELERATOR LABORATORY
U S ATOMIC ENERGY COMMISSION

TITLE
PROTON LABORATORY PHASE G
FLOOR SLABS, SUMPS & DRAIN TILE

DRAWING NO 8-4-4 - PS-2 REV A16

JAN 4 1974