# DESIGN CHANGE NOTICE



DCN NUMBER: **T2B-001**

RFI NUMBER

**Knight/Jacobs Joint Venture**
**701 Scarboro Road; MS 6476**
**Oak Ridge, TN 37830**
**865-241-9433; fax 865-241-3400**

| CONTRACT NO: | PACKAGE TITLE AND DATE | DWG (SNS DOC#): | SHEET NO: | REV NO |
|---|---|---|---|---|
| 02F-1815-01<br>KAT PROJ#:<br>C7024.30 | Central Lab and Office Building (CLO) CFC<br>Dated 12/20/01 | P8E-8600-A011<br>P8E-8600-A066<br>P8E-8600-A069 | P2.B2.62<br>P7.40.40<br>P9.10.40 | **0** |
| | | SPEC NO: TS0716R06 | SECTION: 15111 | |

REASON FOR CHANGE: DVD 010-CLO: Removal of Acid Neutralization System

OTHER DOCUMENTS AFFECTED BY THIS CHANGE: None

DESCRIPTION OF CHANGE: (Provide written description and/or sketch as req'd)

**SKETCHES**

New Sketches Issued:

P-SK-001-2B Remove Ph System
P-SK-002-2B Remove Ph System
P-SK-003-2B Remove Ph System

**SPECIFICATIONS**

Revised Section Issued:

15111R06 Process Waste Drain Piping Systems

| PREPARED BY: | CHECKED BY: | RESPONSIBLE DESIGNER: |
|---|---|---|
| R. WATSON | B. JOHNSON | R. WATSON |

SUBMITTED BY: DESIGN CENTER MANAGER / DATE:

2/12/02

APPROVED BY: SNS TASK MANAGER / DATE:

## PUMP SCHEDULE

| UNIT NO. | SERVICE | LOCATION | TYPE | GPM | HEAD FT. WG. | ELECTRICAL | | | | | BASIS OF DESIGN | REMARKS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | HP | VOLT | PH | HZ | RPM | | | |
| SP-CL-001 | SEWAGE EJECTOR SUMP PUMP | MECHANICAL ROOM B2 LEVEL | DUPLEX VERTICAL CENTRIFUGAL | 50 EACH | 20 | 2@1HP | 460 | 3 | 60 | 1150 | WIEL SERIES 2108 SIZES 3x7 | ①②③④⑤⑥ | |
| CP-CL-001 | CIRCULATION PUMP POTABLE HOT WATER | KITCHEN UTILITY B1 LEVEL | INLINE CENTRIFUGAL | 5 | 10 | 1/12 | 115 | 1 | 60 | 3500 | BELL & GOSSETT MODEL PL-30 | ⑩ | ALTERNATE #1C |
| CP-CL-501 | CIRCULATION PUMP POTABLE HOT WATER | BOILER ROOM 5TH FLOOR | INLINE CENTRIFUGAL | 15 | 20 | 1/6 | 115 | 1 | 60 | 3500 | BELL & GOSSETT MODEL PL-36 | ⑩ | |
| P-CL-001 | WATER CIRCULATION DI SYSTEM | DI EQUIP ROOM B1 LEVEL | SS CENTRIFUGAL END-SUCTION | 220 | 150' | 15 | 460 | 3 | 60 | 3500 | TRICLOVER MODEL 3285 | ⑪ | |
| P-CL-002 | WATER CIRCULATION DI SYSTEM | DI EQUIP ROOM B1 LEVEL | SS CENTRIFUGAL END-SUCTION | 220 | 150' | 15 | 460 | 3 | 60 | 3500 | TRICLOVER MODEL 3285 | ⑪ | |
| LWP-CL-001 | LAB WASTE LIFT STATION | MECHANICAL ROOM B2 LEVEL | DUPLEX VERTICAL CENTRIFUGAL | 45 EACH | 20' | 2@5 HP | 460 | 3 | 60 | 1750 | VANTON PUMP SGH-500 | ①⑦⑧⑨ | |
| BP-CL-001 | BOOSTER PUMP | SECTOR 63 B1 LEVEL | DUPLEX VERTICAL CENTRIFUGAL | 180 EACH | 22 | 2@5 HP | 460 | 3 | 60 | 3500 | METROPOLITAN VES-CS-55D-PH-22B | | |

KEY TO REMARKS

① VERTICAL EJECTOR PUMP, SUBMERGED PUMP & EXTERNAL MOTOR.
② 54" SHAFT LENGTH (BASIN COVER TO SUCTION)
③ FIBER BASIN - 30" DIAMETER x 60" DEEP.
④ CAST IRON BASIN COVER WITH INSPECTION COVER & 2" VENT FLANGE.
⑤ FLOAT LEVEL CONTROL WITH MECHANICAL ALTERNATOR
⑥ STARTER-CONTROL PANEL
⑦ DUPLEX VERTICAL PUMPS WITH 120 GALLON VENTED SUMP TANK
⑧ POLYPROPYLENE SUMP & PUMP WETTED PARTS
⑨ FLOAT CONTROL FOR EACH PUMP
⑩ BRONZE CASING AND IMPELLER
⑪ 316 S'STL CASING, IMPELLER AND TRIM. WETTED SURFACES

LAB WASTE NEUTRALIZATION SCHEDULE REMOVED

SPALLATION NEUTRON SOURCE

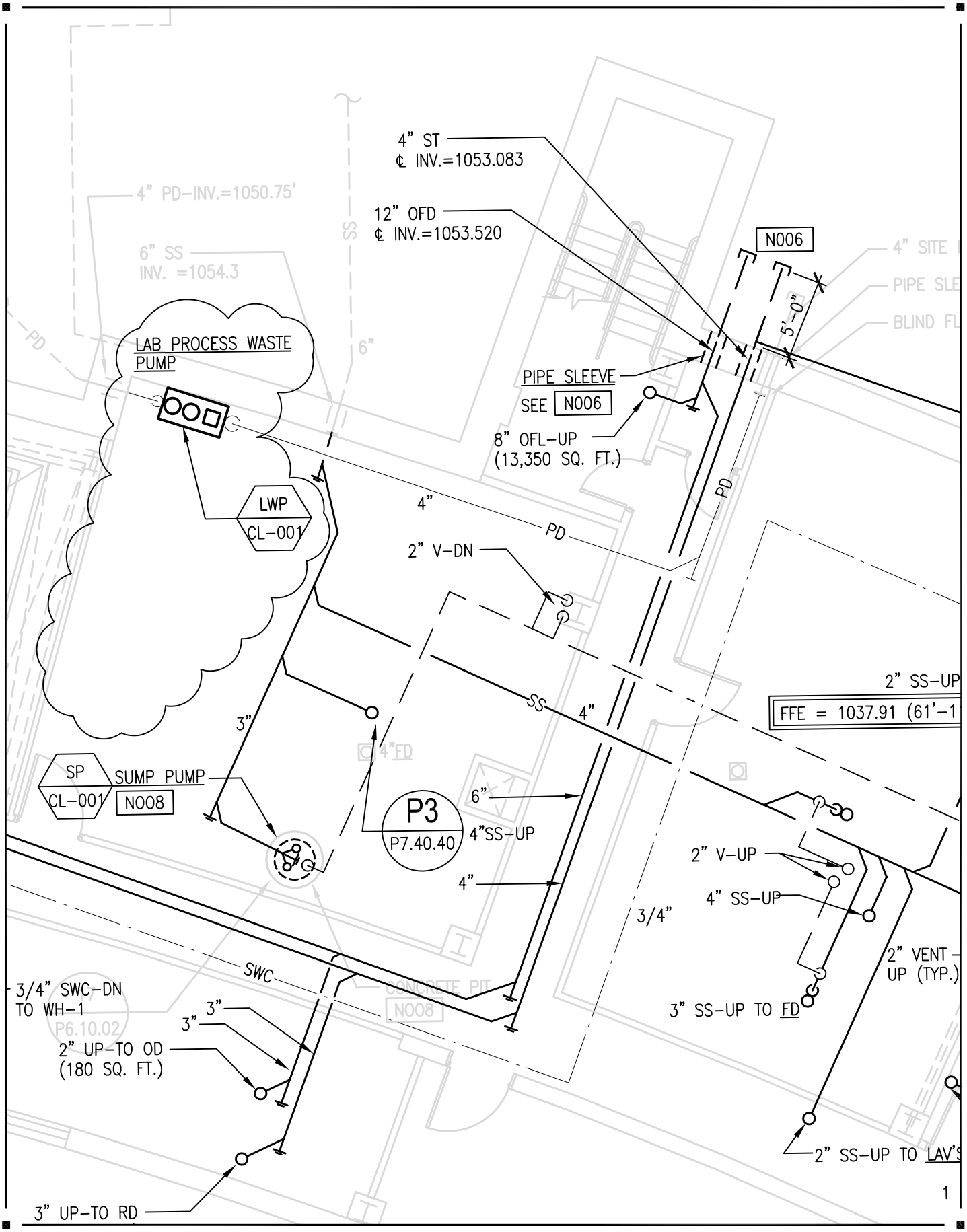
CENTRAL LAB AND OFFICE BUILDING


Knight/Jacobs Joint Venture
701 Scarboro Road, MS 8253
Oak Ridge, TN 37830

865-241-9433
fax 865-241-3400

KNIGHT
Knight Advanced Technology
549 West Randolph Street
Chicago, IL 60661


| SKETCH TITLE | | | SKETCH NO. | |
|---|---|---|---|---|
| REM. pH SYSTEM | | | P-SK-001-2B | |
| DATE ISSUED | DRAWN BY | CHECKED BY | DRAWING NO. | DRAWING REV. |
| 2/12/02 | RTW | BWJ | P9.10.40 | 2 |
| PROJECT NO. | FILE NAME | SCALE | DCN OR RFI NO. | |
| C07024.30 | PSH157000-2B | NO SCALE | DCN # T2B-001 | |

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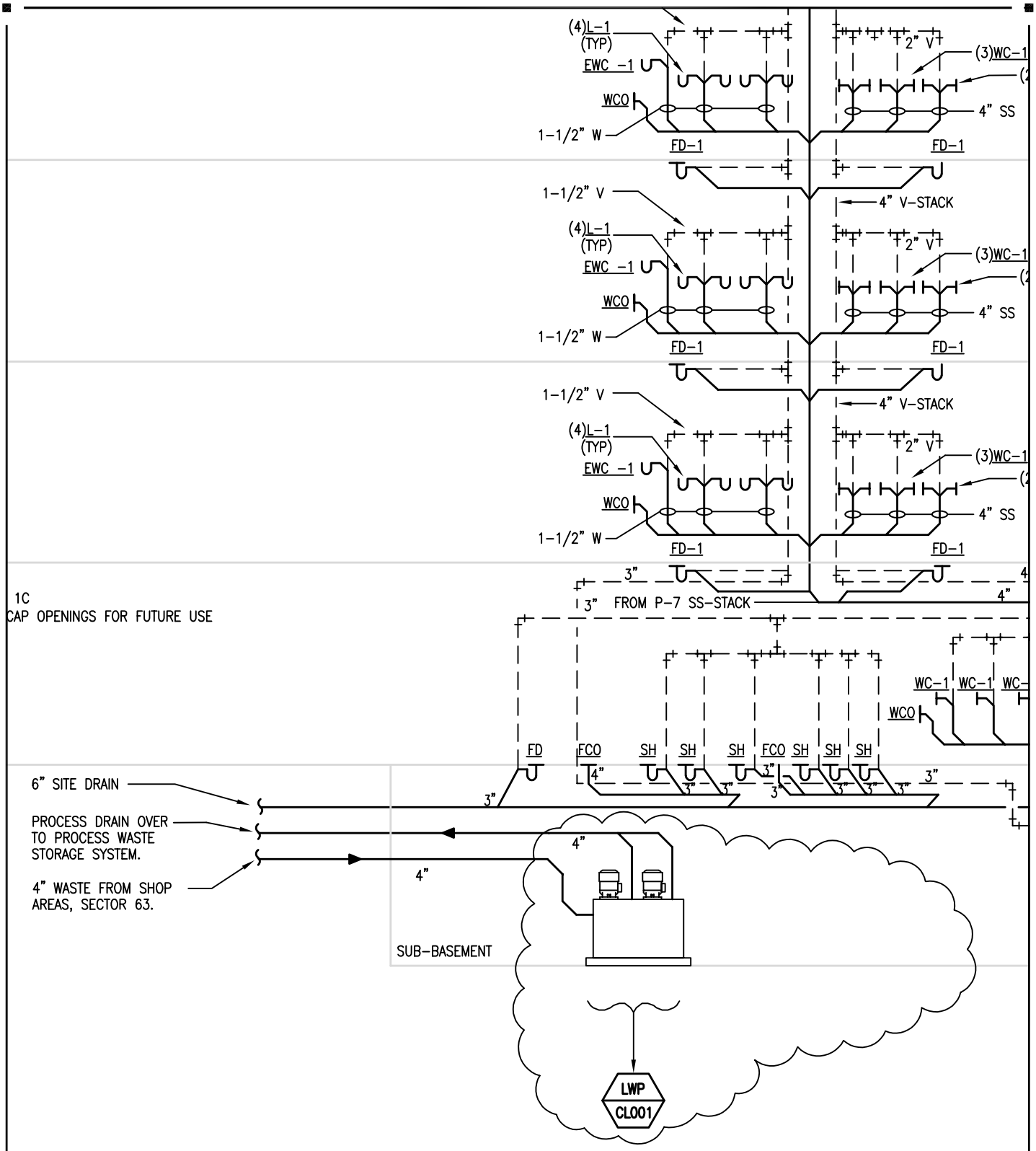
| SKETCH TITLE | REM. pH SYSTEM | | SKETCH NO. P-SK-002-2B | |
|---|---|---|---|---|
| DATE ISSUED | DRAWN BY | CHECKED BY | DRAWING NO. | DRAWING REV. |
| 2/12/02 | RTW | BWJ | P2.B2.62 | 2 |
| PROJECT NO. | FILE NAME | SCALE | DCN OR RFI NO. | |
| C07024.30 | PPPB2A-2B | 1/8" = 1'-0" | DCN # T2B-001 | |

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| SKETCH TITLE | | | SKETCH NO. | |
|---|---|---|---|---|
| REM. pH SYSTEM | | | P-SK-003-2B | |
| DATE ISSUED | DRAWN BY | CHECKED BY | DRAWING NO. | DRAWING REV. |
| 2/12/02 | RTW | BWJ | P7.40.40 | 2 |
| PROJECT NO. | FILE NAME | SCALE | DCN OR RFI NO. | |
| C07024.30 | PPR155000-2B | NO SCALE | DCN # T2B-001 | |

# SECTION 15111
# PROCESS WASTE DRAIN PIPING SYSTEMS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawing and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

### 1.2 SUMMARY

A. This Section includes Polypropylene (PP) plastic piping systems for acid, process and chemical drain service with 180°F (82°C) maximum temperature and 100-psig maximum pressure. These systems are as follows:
   1. Acid Waste and Process Waste drain materials and equipment.

B. This Section also includes piping material restriction installed as Process Waste Drain (PD) in the LINAC & RING Tunnels.

C. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 15, Section 15050, Piping Systems
   2. Division 15, Section 15072, Cleaning
   3. Division 15, Section 15073, Pressure/Leak Testing
   4. Division 15, Section 15074, Identification and Labeling
   5. Division 15, Section 15110, Process Waste Drains Outside Buildings

### 1.3 REFERENCES

A. Southern Building Code Congress International Inc. (SBCCI).
   1. SPC (1997) Standard Plumbing Code.

B. American Society for Testing and Materials (ASTM)
   1. ASTM D 4101 (1996), Standard Specification for Propylene Plastic Injection and Extrusion Materials.
   2. ASTM F 1412 (1997), Standard Specification for Polyolefin Pipe and Fittings for Corrosive Waste Drainage Systems.

C. American National Standards Institute (ANSI).

D. The American Society of Mechanical Engineers (ASME).

E. National Fire Protection Association (NFPA).
   1. NFPA 70 (1996) National Electrical Code (NEC)

### 1.4 DEFINITIONS

A. PP: Polypropylene plastic.

### 1.5 PERFORMANCE REQUIREMENTS

A. Gravity-Flow, Nonpressure-Piping Pressure Rating: 10-foot (3-m) head of water.

B. Gravity-Flow, Double-Contained-Piping Pressure Rating: 5-psig (34.5-kPa) air test pressure.

C. Secondary-Containment-Piping Pressure Rating: 5-psig (34.5-kPa) air test pressure.

D. Force-Main, Double-Contained-Piping Pressure Rating: At least equal system operating pressure but not less than 50 psig (345 kPa).

1.6 SUBMITTALS

A. Product Data: For chemical-waste piping materials, components, and specialties. Indicate dimensions, required clearances, methods of assembly of piping components, and piping accessories.

B. Submit six (6) copies of the following to the Construction Manager:
1. Design Data: Indicate in sufficient detail to verify that products meet or exceed specified performance requirements.
2. Certificates: Certify that products meet or exceed specified performance requirements.
3. Manufacturer's Instructions: Indicate installation and support requirements.
4. Shop drawings: Provide large-scale (Scale of ¼" = 1'-0" minimum) layout drawings, indicating all relevant equipment associated with routing of piping.
Shop drawings shall be "spool" type that includes all piping connection joints, fittings, hangers, supports required and relevant details as required.
5. Coordination Drawings: Include relationship to other services that serve same work areas.
6. Certificates of Shop Inspection and Data Report: As required by ASME Boiler and Pressure Vessel Code.
7. Maintenance Data: For equipment to include in the maintenance manuals as specified in General and Supplementary Conditions.

C. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

1.7 QUALITY ASSURANCE

A. Source Limitations: Obtain pipe, fittings, and joining materials for each piping system through one source from a single manufacturer. Piping materials shall bear label, stamp, or other markings of specified testing agency.
1. Exception: Piping from different manufacturers may be used in same system if indicated and suitable transition fittings matching both piping materials are used.

B. Product Options: Drawings indicate size, profiles, and dimensional requirements of chemical-waste specialties and are based on the specific system indicated.

C. Piping materials shall bear label, stamp, or other markings of specified testing laboratory.

D. Electrical Components, Devices, and Accessories: Comply with NFPA 70.
1. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction, and marked for intended use.

E. Comply with ASME B31.3, "Process Piping."

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver and store piping and specialties with sealing plugs in ends or with end protection.

PART 2 - GENERAL

## 2.1 PROCESS WASTE DRAIN MATERIALS

A. Use materials selected from list below for new systems.

B. Floor Drains and Traps: Shall be of Polypropylene (PP) furnished with fuseal heat fusion joints, sediment bucket, and grate.

C. Floor sink: Shall be polypropylene finish with bucket and strainer. Sink shall be 7 inches square (min.)

D. Cleanout: ANSI A112.36.2M; Provide threaded Polypropylene (PP) cleanout plugs.

E. Sump Pump: Shall be duplex, self contained pumps, all plastic Polypropylene (PP) construction, stainless steel fasteners, pump motor-epoxy coated TEFC weather resistant motor with drop shield, and power interrupt pump down reset. See drawing for sump pump and basin schedule.

F. Valves: 4 inches and smaller shall be Class 150 PP construction. Shut-off valves shall be true-union ball valves, check valves shall be swing-type.

G. Process Waste Drainage Piping:
   1. Above ground: Pressure piping and fittings above ground shall be Schedule 40 Polypropylene (PP), conforming to ASTM D4101, SDR11, rated for 150 psig operating pressure.
      a. PP threaded fittings: Mechanical Joints or fusion joints. Mechanical joints shall be utilized at all Laboratory sinks and Tailpieces.
   2. Below ground: Drainage piping and drainage-pattern fittings below ground of 2” and larger shall be Schedule 40 Polypropylene (PP) with fusion joints, conforming to ASTM F 1412.
      a. Below-grade drainage piping for the Target Building however shall be increased to Schedule 80 Polypropylene (PP) piping. Waste drain system shall be assembled similarly with fusion joints as above, but Schedule 40 weight drainage-pattern fittings are adequate.
   3. Process Waste Drainage (PD) piping materials restriction in the LINAC & RING Tunnels:
      a. Process Waste Drainage (PD) piping materials shall be Steel pipe, ASTM 53, Type E, Electric Resistance Welded (ERW), Grade A, Schedule 40, all welded construction. Copper piping is not allowed in the LINAC & RING Tunnels.
      b. Process Waste Drain (PD) isolation valves shall be V-6168A fitted with radiation resistant UHMWPE valve seat. Valve stem seal shall be graphite.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

A. Install piping system per Standard Plumbing Code.

B. Slope lines to have a minimum pitch of 1/4 in./ft., unless otherwise noted.

C. Support vertical lines at maximum intervals of 10 ft. Maximum horizontal intervals for Polypropylene (PP) pipe is 3 ft. 6 in.

D. Install cleanouts flush with floor with long sweep 1/4-ends or 1/8-bends extended to floor level in location shown on drawings. Caulk cleanout plug assembly with countersunk cleanout plug into hub of fitting with plug face flush with floor.

E. In other cases, form cleanouts by using tee or "Y" pattern branch fittings with screw plugs of the same size as the pipe up to and including 4 in.

F. Install cleanout plugs at foot of new vent stacks.

G. Identification/Labeling: Section 15074.

3.2 FIELD QUALITY CONTROL

A. Pressure/Leak Test: Section 15073, Class C.

3.3 CLEANING

A. Clean piping systems per project specifications, Section 15072, Cleaning.

**END OF SECTION 15111**