DOP

UNITED ENGINEERS & CONSTRUCTORS INC.

PHILADELPHIA, PENNSYLVANIA 19105

SPECIFICATION

for

YARD STORM DRAINAGE

and

YARD AND BUILDING STANDPIPE

FIRE PROTECTION SYSTEM

UNIT No. 3

Westinghouse Electric Corporation

Indian Point Generating Station - Unit No. 3

for

Consolidated Edison Company of New York

Date: January 26, 1970

Spec. No. 9321-05-44-3

1-4-70
J.W.

I N D E X

SECTION I

GENERAL INFORMATION

OWNER: . . . . . Consolidated Edison Company of New York

ENGINEERS: . . . . . United Engineers & Constructors Inc.
1401 Arch Street
Philadelphia, Pennsylvania 19105

DESCRIPTION: . . . . . Refer to Section II, under Item 1, "Scope."

LOCATION: . . . . . Indian Point Generating Station, Unit No. 3, near Peekskill, New York

SECTION II

EXTENT OF WORK

1. SCOPE

The work shall consist of the following:

A. Furnish and install yard storm drainage system including catch basins and manholes.

B. Furnish and install yard fire protection system including hydrants and post indicator valves.

C. Install turbine hall standpipe fire protection system. Fabricated pipe will be furnished by Others under P.O. 9321-05-248-35.

2. RULES AND REGULATIONS

All work performed and all materials supplied under this specification shall be in accordance with all rules, regulations, and ordinances of the various bureaus having jurisdiction including New York State, applicable Federal Regulations and Associated Factory Mutuals or the National Board of Fire Underwriters.

3. TESTS

All concealed or buried piping shall be tested and proved tight before being built-in or back-filled. Fire lines shall be tested in accordance with Associated Factory Mutuals or the National Board of Fire Underwriters standards. The hydrostatic test pressure shall be 200 pounds per square inch applied for a period of not less than two hours. All joints shall be made tight at these pressures.

Any leaks that develop shall be repaired in an approved manner and to the satisfaction of the Constructors. Required test shall then be repeated until the system is proven tight.

Before any back-filling is done, underground drainage lines shall be subject to a careful inspection for grading, alignment of pipe, construction of joints, cracks and other defects in workmanship and materials. All defective work shall be corrected to the satisfaction of the Constructors.

3. TESTS (cont'd)

All tests shall be made in the presence of the Constructors or their authorized representatives.

All bolts and rods on underground pipe and fittings shall be given a heavy coating of hot bitumastic or asphaltum paint after tests have been completed and approved.

4. CLEANING AND ADJUSTING

At the completion of the installation, all water piping shall be thoroughly flushed and drained to remove all grease, chips, dirt, or other foreign matter. All points of lodgement in the storm and drain pipe systems shall be cleaned of all dirt and debris. After flushing, the water lines shall be refilled and left ready for use.

5. CLEANING AND PATCHING

No cutting of walls or burning of holes in structural steel, necessary for erection of pipe or pipe supports, shall be done by the Contractor unless approval has been given by the Constructors.

SECTION III

MATERIAL AND EQUIPMENT

1. CARBON STEEL PIPE

Carbon steel pipe shall be ASA (ANSI) Schedule 40, ASTM Specification A-53, of A-106, Grade A, seamless or resistance weld. Pipe shall be black or galvanized steel, plain or coated and wrapped, and cement lined, as called for under Section V, Piping Systems, or the drawings. Nipples shall be of the same material as the pipe. Close nipples shall not be used.

Steel pipe buried in ground shall be wire brushed and shop or field wrapped with coal tar and asbestos felt in accordance with AWWA Specification C203, latest revision.

Cement lining for steel pipe shall meet the requirements and shall be applied in accordance with AWWA Specification C205-62T (or the latest revision).

A. Fittings

Welding fitting shall be Schedule 40 and flanges shall be 150# weld neck. They shall be coated and wrapped or plain, cement lined--to conform and be consistent with pipe used.

B. Valves

All shutoff valves one inch and larger shall be gate valves. Valves shall be brass, screwed, rising stem, Crane Company's No. 431 for 150 lb. SWP, or approved equal.

2. CAST IRON PIPE

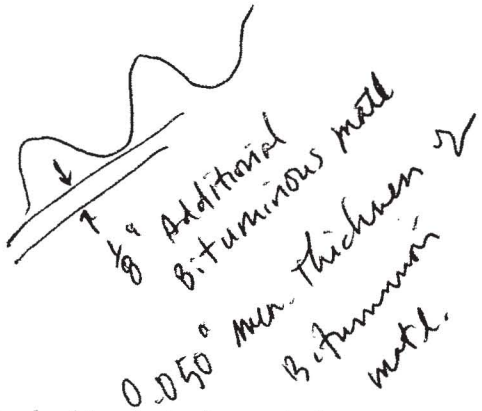
Pipe shall be either AWWA Class 150 or extra-heavy cast iron soil pipe, as designated on the drawings, with bell and spigot ends. Pipe installed in ground shall be coated with Roskote 612-XM.

A. Fittings

Fittings for AWWA bell and spigot pipe shall be Class 250 for fittings 12 inches and under, and Class D for fittings 14 inches and up. Fittings for cast iron soil pipe shall be extra-heavy bell and spigot.

B. Joint Yarning

Yarning for cast iron drain piping shall be either twisted jute or oakum.



2. CAST IRON PIPE (cont'd)

C. Lead

Lead for joints shall be commercial soft pig lead and shall contain not less than 99.9 percent metallic lead.

3. CORRUGATED METAL PIPE

Corrugated metal pipe shall be Armco galvanized smooth-flo sewer pipe, or approved equal. This pipe shall be fabricated and riveted in accordance with A.A.S.H.O. Specification M-36, latest revision, except that the longitudinal seams shall be riveted on the outside crest of each corrugation. Field joints shall be made with bands of the same material as the pipe and shall be a minimum of seven inches wide for pipe up to 30 inches in diameter and a minimum of 12 inches wide for pipes greater than 30 inches in diameter. The seven inch band shall have at least two galvanized bolts not less than 1/2 inch in diameter. The 12 inch shall have three bolts.

Pipe 21 inches in diameter and under shall be fabricated from 16 gauge steel sheets, pipe over 24 inches from 14 gauge.

The bituminous material for the pipe shall withstand freezing temperatures without cracking and elevated temperatures of about 150 F without flowing or sagging. The pipe shall be uniformly coated inside and outside with a 0.05 inch minimum thickness of bituminous material. Additonal bituminous material shall be centrifugally applied to the interior of the pipe filling the corrugations and providing a smooth lining having a minimum thickness of 1/8 inch above the crest of the corrugations.

Elbows, stubs and all other appurtenances, when called for on the drawings shall be fabricated of the same material as the pipe.

All pipe sections shall be furnished with lifting lugs or brackets to permit handling pipe without damaging coating.

4. MANHOLE FRAMES AND COVERS, CATCH BASIN AND TRENCH FRAMES WITH GRATING

All frames, covers and grating shall be made of close-grained grey cast iron of the type and size tabulated on the drawings and shall be as manufactured by Flockhart Foundry Company, or approved equal.

5. FIRE HYDRANTS

Fire hydrants shall be compression type; ductile iron, one-piece barrel with five inch bottom valve and six inch flanged inlet connection; two 2½ inch diameter hose nozzles; 4½ inch pumper nozzle; pentagon operating nut 1½ inch from point to flat, turn counterclockwise to open; depth of bury as called for on the drawings; and operating wrenches.

5. FIRE HYDRANTS (cont'd)

Hydrants shall be made to Factory Mutual specifications; 175 lbs working pressure, 300 lbs test pressure and shall be Darling b-50-b, Kennedy Figure 1080, R. D. Wood, or approved equal. Threads shall be National (American) Standard.

6. VALVES AND INDICATOR POSTS

Valves shall be Factory Mutual approved, 175 lb cold water rating, 300 lb hydrostatic test, ductile iron bronze mounted, non-rising steam, turn counterclockwise to open and flanged connections.

Factory Mutual approved indicator posts and/or extension valve boxes shall have depth of bury called for on the drawing.

Valves shall be Kennedy Figure 701 or approved equal. Indicator posts shall be Kennedy Figure 541, or approved equal. Extension valve boxes shall be as specified on the drawing.

SECTION IV

INSTALLATION

1. STEEL PIPE

Black carbon steel pipe shall be beveled for welding. Galvanized steel pipe shall be assembled with screw joints using standard threads. Threaded joints shall be made tight with graphite and oil, or approved jointing compound, applied to the male thread only.

All pipe shall be placed on end and well hammered to remove all scale, dirt, and rust before being assembled.

Cement lined steel pipe shall be assembled by welding. Welding shall be performed with small, low heat welding rods, to avoid excessive temperatures. Pipe shall be cut with a saw or pipe cutting machine to ensure a square cut. Joints shall be lightly buttered with a joint compound (in accordance with accepted recommended practice) before butting and welding.

Coated and wrapped steel pipe shall be assembled by welding. Welded field joints shall be cleaned, primed and coated in accordance with AWWA Specification C203, latest revision.

2. CAST IRON PIPE

Cast iron soil and AWWA pipe shall be assembled with bell and spigot joints.

The pipe shall be laid to true alignment and pitched to grades shown on the drawings. Pipes shall be graded and provided with firm and uniform supports. Adjacent lengths of pipe shall be adjusted with reference to each other as blocking or wedging between bell and spigot will not be permitted. Open ends of pipe, at the close of each day's work, shall be sealed with temporary wood plugs to prevent the entrance of foreign matter.

Picked oakum or jute yarn of best commerical grade shall be packed tightly into the annular spaces between the pipes to a depth of 1½ inches, measured from the bottom of the bell. Gaskets shall not project into the bore of the finished joints. After the gaskets are placed, the joints shall be cleaned and the remaining space filled at one pouring with soft pig lead which shall be properly caulked to assure tight joints without overstraining the iron of the bells. After caulking, the lead shall be practically flush with the faces of the bells.

All tees, plugs, bends and valves of cast iron pipe lines under pressure shall be securely anchored in an approved manner by means of tie rods and pipe clamps. Clamps shall be made up of 3/4 inch x 2 inch steel flat bar with 5/8 inch diameter bolts and 3/4 inch diameter tie rods. Clamps, when used at steel to cast iron joints, shall be welded to steel pipe. Clamp assembly shall be given a heavy coating of hot bitumastic or asphaltum paint after pressure tests have been completed and approved.

INSTALLATION

3. CORRUGATED METAL PIPE

The corrugated pipe shall be assembled with standard coupling bands. The pipe shall be laid true to alignment and pitched to grades shown on the drawings. Where pipe connects to manholes or catch basins, the ends shall be placed or cut-off flush with the inside face of the structure.

Pipe trench shall be cut to permit thorough compaction of the back-filling material around the pipe. Where rock or hard shale is encountered, it shall be excavated below the bottom of the pipe for a depth of eight inches and replaced with well-tamped compactible material.

Where pipe is to be placed in fill, the fill construction must be completed to an elevation eight inches above the elevation of the crown of the pipe and then trench excavated and pipe placed.

Excavation at pipe ends for installation of pipe bands shall be held to a minimum.

Trench shall be back-filled with compactible soil material free from large stones, hard lumps or clods larger than three inches in diameter, sod, cinders or frozen fill. Fill shall be compacted by hand or pneumatic tampers in layers not exceeding six inches in compacted thickness. The back-fill shall be brought up evenly on both sides of the pipe for its full length to avoid lateral displacement of the pipe. *

Coupling bands shall be field coated with Bitumastic #50, manufactured by the Koppers Company, Inc. , or approved equal. Coating or lining bruised or damaged in shipment, installation, or burned by cutting or welding, shall be repaired by the application of the bituminous material used for shop coating the pipe or other suitable and approved material.

4. PIPE HANGERS, ANCHORS AND SUPPORTS

All piping shall be properly supported by substantial, adjustable wrought or malleable iron clevis-type hangers with steel rods suspended from malleable iron or wrought iron beam clamps or inserts.

Where indicated on drawings or required, provide suitable anchors and special strap type hangers and supports.

Hangers for lines larger than 1½ inches shall be placed not more than ten feet on centers; for lines 1½ inches and smaller, not exceeding eight feet on centers or at shorter intervals where necessary to prevent sagging and vibration. Vertical lines shall be substantially supported at the floor construction.

Furnish and install all structural steel required for the installation of pipe hangers and anchors.

INSTALLATION

5. INSERTS

Inserts shall be cast iron or cast steel, designed to receive a machine bolt head or nut after installation. They shall permit adjustment of the bolt in one direction and shall be so designed and installed to develop the full strength of the bolt when installed in properly cured concrete.

6. SLEEVES

All sleeves shall be installed where called for on the drawings. Asbestos wool packing shall be provided in space between the sleeve and pipe passing through it for those located in walls above grade and lead and oakum, for a water-tight joint, in those located in walls below ground level.

7. VALVE INSTALLATION

Valves shall be installed where specified or indicated on the drawings for the proper control of equipment, draining of lines, or to facilitate the removal of repair of any piece of apparatus without interfering with the use of other apparatus.

8. CLEANOUTS

All cleanouts shall be accessible and shall be installed at the ends of all horizontal drain lines and all other points shown on the drawings.

SECTION V

PIPING SYSTEM

Unless otherwise noted on the drawings, piping systems shall be installed with material called for below. All steel pipe, except pipe sleeves, buried in ground shall be coated and wrapped as specified under Item 3, Fire Lines-yard.

1. UNDERGROUND PIPE SLEEVES

   All lines, except corrugated metal pipe, installed under railroad tracks shall be run in standard weight steel pipe sleeve coated with Reskote 612-XM, and shall be provided with insulating spacers to eliminate the possibility of metallic contact between pipe and casing.

2. STORM DRAINS

   Yard storm lines shall be assembled using corrugated galvanized smooth-flow sewer pipe, unless specified otherwise on the drawings.

3. FIRE LINES-YARD

   Piping shall be assembled using Schedule 40 cement lined, coated and wrapped black steel pipe and weld fittings. Pipe joints are welded but connections to post indicator valves and hydrants shall be flanged. Flanged connections shall be made up with rust-proofed steel bolts and then given a heavy coating of hot bitumastic or asphaltum paint.

4. FIRE LINES-STANDPIPE SYSTEM

   Building standpipe fire protection system will be fabricated from Schedule 40, cement lined, black steel pipe and weld fittings. This pipe will be furnished under P.O. 9321-05-248-35.

SECTION VI

GENERAL

1. SHOP DRAWINGS

Twelve (12) copies of cuts, descriptive matter, and detailed prints of all equipment and accessories specified herein or on drawings together with one (1) sepia of each, shall be submitted for approval.

After approval, twelve (12) copies of all approved prints, and descriptive matter with one reproducible of each, shall be furnished for final distribution.

SPECIFICATION NO. 9321-05-44-3

TITLE: YARD STORM DRAINAGE & YARD & BUILDING STANDPIPE FIRE PROTECTION SYSTEM

PURCHASE ORDER NO. WEC-

VENDOR:

UNIT: #3

INDEX

Addendum A
to
UE&C Specification 9321-05-44-3, dated January 26, 1970

Specification for Yard Storm Drainage and Yard and Building Standpipe Fire Protection System

SYSTEM: MULT
QA CAT: CAT M
FILE #:
COMP. PRINTOUT LOC:

Prepared By: [signature] 2/6/01
Reviewed By: [signature] 2/2/01
Verified By: [signature] 2/6/01
Approved By: [signature] 2/7/01

Effective Date: February 7, 2001

Addendum A
to
UE&C Specification 9321-05-44-3, dated January 26, 1970

Specification for Yard Storm Drainage and Yard and Building Standpipe Fire Protection System

Revise the Index to add Appendix A, "Piping Schedule and Material Data Specification Sheets"

Revise Section II, "Extent of Work", Subsection 1, "Scope", Item C to read:

"C. Furnish and install turbine hall standpipe fire protection system."

Add a note to Section III, "Material and Equipment," just prior to Subsection 1, "Carbon Steel Pipe" to read:

"Section III, "Material and Equipment" applies to the yard storm drainage system and the yard fire protection system. For material and equipment for the turbine hall standpipe fire protection system refer to Appendix A, "Piping Schedule and Material Data Specification Sheets"."

Revise Section V, "Piping System", Subsection 4, "Fire Line-Standpipe System" to read:

"4. Building standpipe fire protection system will be fabricated from schedule 40, cement lined, black steel pipe and welding fittings."

Add Appendix A, "Piping Schedule and Material Data Specification Sheet" as detailed on the following pages.

Note to Users: Addendum A is being processed to include the "Piping Schedule and Material Data Sheet" for the standpipe fire protection system (SFP) from UE&C Specification 9321-05-248-35 which is being superseded by this addendum and NYPA Specification TS-MS-027.

PIPING SCHEDULE and MATERIAL DATA SPECIFICATION SHEET

CLASS Not used (Page 1 of 3)
SYMBOL FP *(Note 1)*

DESIGN PRESSURE 150 psig max.
DESIGN TEMPERATURE 100°F

Material designation applies to ASTM specification. ASME "SA" material designation may be used in place of "A."

PIPE

10" & smaller — A-53, Gr. B, Type S (seamless), Schedule 40, cement lined *(Notes 2, 3 & 4)*

FITTINGS

10" & smaller — A-234 Gr. WPB, Schedule 40, butt weld, cement lined

FLANGES

10" & smaller — A-181, Class 60 *(Note 5)*, 150 lb. ANSI, welding neck (preferred) cement lined or slip-on, flat face

VALVES

Drain *(Note 6)*

2" & smaller — B-61, 150 lb. ANSI, threaded ends, bronze trim

BOLTING

Bolts — A-193, Gr. B7 *(Note 7)* Full threaded
Nuts — A-194, Gr. 2H *(Note 8)* Semi-finished, hex

GASKETS

1/8" thick full face, red rubber

UNIONS

Not permitted (use flanges)

PIPING SCHEDULE and MATERIAL DATA SPECIFICATION SHEET

CLASS	Not used (Page 2 of 3)
SYMBOL	FP *(Note 1)*

NOTES

1. Symbol SFP, "Standpipe Fire Protection System" has been changed to FP, "Fire Protection" to reflect current system designation.
2. A-106, Gr. B may be substituted for A-53, Gr. B. A-106 is not one of the standards cited in the National Fire Codes which are applicable to the design of the fire water distribution piping and standpipe system located in the Turbine Building (i.e., NFPA 13-1969, NFPA 14-1969 & NFPA 16-1968). However, A-106, Gr. B has been reviewed and found acceptable as it meets or exceeds the requirements (i.e., chemical properties, physical properties and dimensions) of standard ASTM A-120 which is cited in the National Fire Codes. It should be noted that A-120 has since been withdrawn by ASTM and has been replaced by A-53. A-53 has since been cited in the National Fire Codes.
3. Pipe 4" & larger shall be cement lined in accordance with AWWA C205-62T or latest edition. Pipe smaller than 4" shall be lined using cement which is low lime, high silica content, applied to the pipe centrifugally, and to fittings by hand. The mechanical strength shall be sufficient to withstand ordinary handling without damage. The inside surface of the lining shall be smooth throughout. Cement lining thickness shall be as follows:

Pipe Size	Lining Thickness	Tolerance
¾"-1"	0.06"	+1/64",-0"
1-1/2"	0.08"	+1/32", -0"
2", 2-1/2"	0.1"	+1/32", -0"
3", 3-1/2"	0.13	+1/32", -1/64"

4. Coal-tar enamel lining for pipe smaller than 4" may have been used in past installations. However, its use in new installations is no longer permitted.
5. A-105 may be substituted for A-181, Class 60 which superceded A-181, Grade I.
6. Valve service has been clarified to reflect system design and use. Original control and sectionalizing valves employed in the system were not purchased under this specification (or UE&C Specification 9321-05-248-35), rather they were purchased under P.O. 9321-05-248-10.
7. A-193, Gr. B7 shall be substituted for A-307, Gr. A.
8. A-194, Gr. 2H shall be substituted for A-307.

PIPING SCHEDULE and MATERIAL DATA SPECIFICATION SHEET

CLASS Not used (Page 3 of 3)
SYMBOL FP *(Note 1)*

SERVICE

Seismic Class 1 *(Clarification 1)*

Fire water distribution piping located in the Control Building including connections up to but excluding control valves (i.e., FP-2-1, FP-2-2, FP-3-2, FP-3-1) for the water spray systems provided for the main, station auxiliary and unit auxiliary transformers *(Clarification 4)*.

Seismic Class 3 *(Clarification 1)*

Fire water distribution piping and standpipe system located in the Turbine Building which includes:

- 10" looped fire water distribution piping in the Turbine Building except as modified by B&R specification IP-8 *(Clarification 2)*,
- Various hose stations located throughout the Turbine Building up to but excluding hose angle valves *(Clarification 3)*,
- Connections up to but excluding control valves (i.e., FP-3-3, FP-3-6, & FP-3-5) for the foam-water spray systems provided for the lube oil reservoir, boiler feed pump oil console and accumulators, and hydrogen seal oil unit *(Clarification 4)*,
- Connection up to but excluding control valve (i.e., FP-4) for the sprinkler system provided for lube oil storage room (now known as 36 battery and charger rooms) *(Clarification 4)*,
- Connection up to but excluding the first flanged joint for the foam water spray system provided for the lube oil storag · tank (the connection from the flanged joint was modified by B&R specification IP-8),
- Conne.tions to the yard fire protection system (i.e., underground distribution piping) up to but excluding sectionalizing valves (i.e., FP-1-3 & FP-1-4) *(Clarification 4)*.

CLARIFICATIONS

1. Seismic classes are based on FSAR Figure 9.6-9B (Rev. 8, June 2000)
2. Modification of the Turbine Building fire water distribution piping under B&R Specification IP-8 includes:
   - addition of sectionalizing valves FP-74, FP-75, FP-76, FP-77-1, FP-78 and FP-79,
   - connection, including the tee at the 10" header, for the pre-action water spray system provided for the turbine generator (lube oil piping and bearings),
   - connections, including the tee at the 10" header, for the water spray systems provided for the boiler feed pumps, wall between the Turbine Building and 31 main transformer and the unit auxiliary transformer, and the wall between the Turbine Building and the pipe bridge to the Auxiliary Feedwater Building,
   - connections, including the tee at the 10" header, for the general area sprinkler systems provided for elevations 15' and 36'9" of the Turbine Building,
   - 8" connection (alternate feed) including tee at the 10" header for the pre-action water spray systems provided for the Electrical Tunnels.
3. Hose angle valves were provided under UE&C specification 9321-05-70-3.
4. Control Valves FP-2-1, FP-2-2, FP-3-2, FP-3-1, FP-3-3, FP-3-6, FP-3-5 & FP-4 and sectionalizing valves FP-1-3 & FP-1-4 were provided under P.O. 9321-05-248-10.