FIRE ENDURANCE TEST OF 3M INTERAM™ FIRE WRAP FIRE PROTECTIVE ENVELOPE

Project No. 8610-102570

FIRE ENDURANCE TEST TO QUALIFY PROTECTIVE ENVELOPES FOR CLASS 1E ELECTRICAL CIRCUITS

May 19, 1998

Prepared For:

Promatec Technologies, Inc.
P.O. Box 309
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OMEGA POINT LABORATORIES

ABSTRACT

Various raceway configurations clad with 3M Interam™ Mat materials as described herein, were evaluated in accordance with the PCI/Promatec TEST PLAN No. CTP-2009 "Three (3) Hour Fire Endurance Test 3M Interam™ Fire Wrap," and Supplement 1 to the U.S. Nuclear Regulatory Commission Generic Letter 86-10.

The details, procedures and observations reported herein are correct and true within the limits of sound engineering practice. All specimens and test sample assemblies were produced, installed and tested under the surveillance of either PCI/Promatec's or the Laboratory's in-house Quality Assurance Program. This report describes the analysis of a distinct assembly and includes descriptions of the test procedure followed, the assembly tested, and all results obtained. All test data are on file and remain available for review by authorized persons.

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Date 8/12/98

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Date 8/12/98

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INTRODUCTION

The protection of vital electrical circuits from the effects of an external fire exposure is of primary concern in the design and construction of an electrical power generating plant. Typical "fire protective envelopes" are designed to protect the contents of an electrical raceway for fire exposure periods of one to three hours, during which time the electrical circuitry must remain functional, as defined in Generic Letter 86-10, Supp. 1.

The external fire exposure selected to evaluate protective envelope systems is that described in the ASTM E119-95a Fire Tests of Building Construction and Materials (E119 Time-Temperature Curve, described later in this document). The ASTM E119 test procedure is identical or very similar to the following standard test methods:

UL 263
UBC 7-1(43-1)
NFPA 251

Typical fire test programs involve the selection and construction of a specific electrical raceway system, instrumentation for thermal and circuit integrity measurements, followed by the application of the protective envelope system by qualified personnel.

This standard should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment that takes into account all the factors that are pertinent to an assessment of the fire hazard of a particular end use.

OBJECTIVE

The objective of this project was to qualify various configurations of 3M Interam™ E50 series fire wrap systems for use as 3-hour fire-protective envelopes for redundant electrical systems, in accordance with the criteria established by the USNRC in Generic Letter GL-86-10, Supplement 1. The entire program was carried out in accordance with the PCI/Promatec, TEST PLAN No. CTP-2009, *Three (3) Hour Fire Endurance Test 3M Interam™ Fire Wrap*, which may be found in Appendix B of this document. For reasons of clarity and to reduce redundancy, many items discussed in the Test Plan have not been duplicated elsewhere in this document.

TEST PROCEDURE

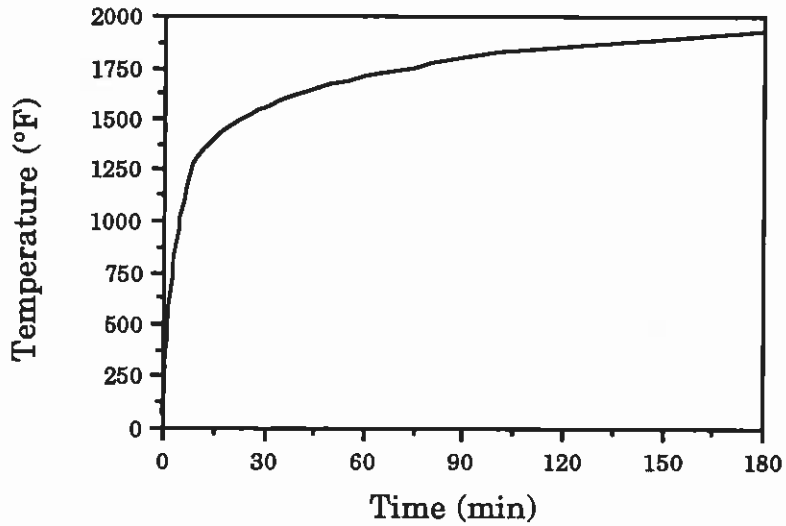
FIRE TEST FURNACE

Horizontal Test Furnace

The 12' x 18' x 7' - 10' deep (the depth of the furnace can be increased by stacking concrete blocks on the ledge) horizontal test furnace is designed to allow the test specimen to be uniformly exposed to the specified time-temperature conditions. It is fitted with 12 symmetrically-located premixed propane/air burners, located 12" above the floor of the furnace, and designed to allow an even heat flux distribution across the under surface of a horizontal test specimen. Furnace pressures may be maintained at any value from +0.5" W.C. to -0.05" W.C. at the exposed surface of the test article. The burners, when fully fired, will deliver 20 MBtu/hr total heat input. The furnace consists of a structural steel frame, lined with sheet metal and insulated with a six inch thick layer of ceramic fiber. One wall of the furnace contains a personnel door to allow access to the inside with the test article in place.

The temperature within the furnace is determined to be the mathematical average of thermocouples located symmetrically within the furnace and positioned 12 in. away from representative parts and locations of the test specimen. The exact positioning of the thermocouples is such that the average fire exposure across the entire test specimen can be determined. The materials used in the construction of these thermocouples are those suggested in the E119 test standard. During the performance of a fire exposure test, the furnace temperatures are monitored at least every 15 seconds and displayed for the furnace operator to allow control along the specified temperature curve. All data is printed to paper every 30 seconds and saved to magnetic disk every minute.

The fire exposure is controlled to conform with the standard time-temperature curve shown in Figure 1, as determined by the table below:



Time (min)	Temperature (°F)
0	68
5	1000
10	1300
20	1462
30	1550
45	1638
60	1700
90	1792
120	1850
180	1925

Figure 1

The furnace control thermocouples are enclosed in protection tubes of such material and dimensions that the time constant of the thermocouple assembly lies between 5.0 and 7.2 minutes, as required by the E 119 standard. The furnace temperature during a test is controlled such that the area under the time-temperature curve is within 5% of the corresponding area under the standard time-temperature curve for the three hour test period.

The furnace pressure is controlled to be as nearly neutral with respect to the surrounding laboratory atmosphere as possible, measured at the vertical mid-height of the test specimen. Adjusting the neutral plane at that position results in a nominal +0.015 in. WC pressure at the top of the specimen (under the surface of the slab) and –0.015 in. WC pressure at the bottom of the specimen.

THERMOCOUPLES

Temperatures on the interior of the fire protected systems were measured with Type K, 24 GA., Chromel-Alumel electrically welded thermocouples formed from Chromel and Alumel wires of "special limits of error (±1.1°C)," and covered with braided fiberglass insulation. The fiberglass insulation material begins to break down at temperatures above 800°F. Temperature readings above 500°F can not

be guaranteed as accurate since the thermocouple conductors may no longer be adequately separated.

HOSE STREAM TEST

According to the Test Plan, following the fire exposure test, the test specimen is to be removed from the test furnace and exposed to the impact, erosion, and cooling effects of a hose stream directed perpendicular to the exposed surface of the test specimen as outlined in the standard. The stream is delivered, for a minimum period of 5 minutes, through a 1-1/2 in. fog nozzle with an adjustable stream, with a nozzle pressure of 75 psi, a spray angle of 30° and with the tip of the nozzle a distance of 5 ft. from the exposed face. The nozzle is to flow a minimum of 75 gpm during the hose stream test. It is recognized that, with a three-dimensional object, not all surfaces can be attacked by the hose stream test. For this reason, the hose is moved about to allow the stream to play against the sides, inside and outside vertical surfaces and the underside of the item, resulting in little, if any, direct force being applied to the inside top surface of the specimen. This exposure, however, meets the intent of hose stream applications specified in USNRC GL 86-10 Supplement 1.

TEST ASSEMBLY

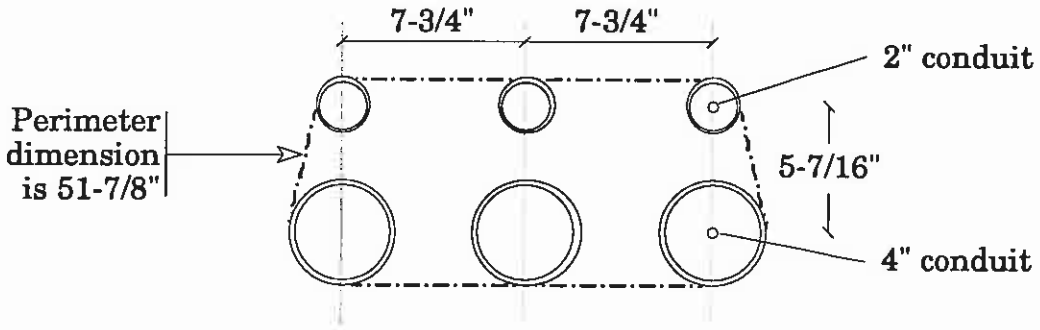
CONCRETE SLAB

An 8" thick, normal weight concrete slab, outside dimensions of 156" x 96", was constructed by casting concrete into a rectangular form consisting of 8" structural steel channel, with #5 steel rebars welded to the inside of the channel on 12" centers in both directions, with a minimum embedment of 2-1/2". The concrete slab contained two unlined blockouts, as indicated in Fig. 5 Slab Reinforcement Details, Appendix A. The slab was allowed to set at room temperature for 10 days and then acceleratedly dried by placing it in an atmosphere of 350°F for six days. It was then cooled and placed on a secure work stand for installation of the raceway configurations.

RACEWAY CONFIGURATIONS

All raceway configurations, as well as the cladding which was applied to them, are well described in the Test Plan (Appendix B). The following consists of a brief description of each.

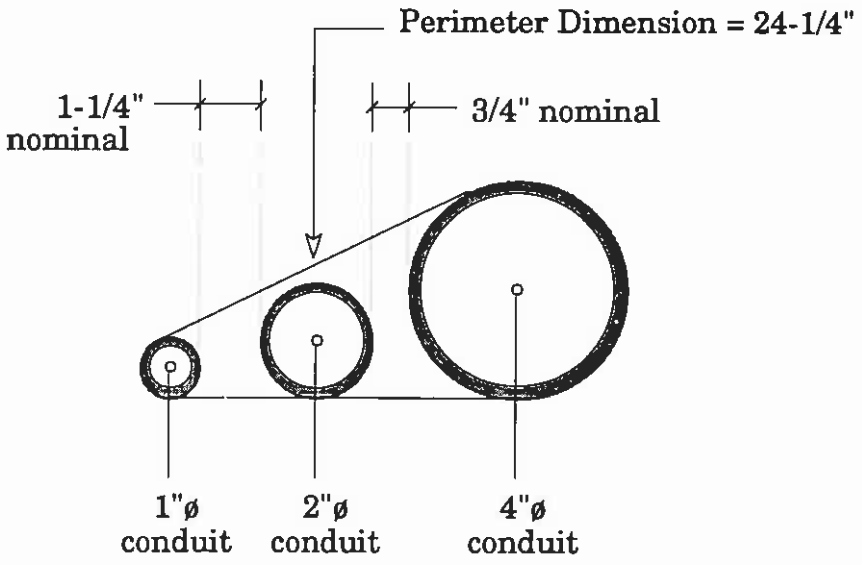
Article 1: Multiple rigid steel conduit bank consisting of three 4"ø and three 2"ø conduits (OPL designation: Conduits 1 - 6). The placement of the conduits and calculation of the perimeter dimension of this array are shown in cross-section below:



Article 2: Steel junction box 36" x 19" x 10" (OPL designation: Junction Box #3).

Article 3: Steel junction box 12" x 12" x 8" with one face against the concrete (OPL designation: Junction Box #1).

Article 4: Rigid steel 1"ø conduit with multiple interfering items [OPL designations: Conduits #10 (1"ø), 11 (2"ø) & 12 (4"ø)]. Since Conduits 11 & 12 were the "interfering items," they were not instrumented with Bare #8 AWG conductors containing thermocouples.



Article 5: Trapeze hanger configuration consisting of 1/2"-13 threaded rod and P-1001 Unistrut™ (no OPL designation: considered a part of Article 4).

Article 6: Rigid steel conduit 4" in diameter proximate to concrete (OPL designation: Conduit #9).

Article 7: Steel junction box 12" x 12" x 8" with one face against the concrete (OPL designation: Junction Box #2).

All steel materials utilized in the construction of this test article were provided and installed by Omega Point Laboratories (OPL). Drawings of the test items and supports are located in Appendix A: Construction Drawings.

Once the test article raceways and supports were completed, OPL personnel attached thermocouples to each raceway item in accordance with the Test Plan, and as indicated in Appendix C, Thermocouple Locations. Thermocouples were positioned along the bottom of each raceway (except where indicated otherwise in Appendix C), each being held in position by clamping under the head of a #8 x 32 x 1/4 in. long stainless steel round-head machine screw in a drilled and threaded hole at each location.

In order to monitor temperatures in the interior of each raceway, bare #8 AWG stranded copper wires were instrumented with 24 GA., Type K, Chromel-Alumel electrically-welded thermocouples (Special Limits of Error: ±1.1°C, purchased with lot traceability and calibration certifications) placed nominally every 6 in. along the length of wire. The thermocouples were attached to the bare #8 AWG stranded copper wire by placing the thermojunction in direct contact with the top surface of the wire and crimping the junction to the copper wire with a copper Buchanan 2011S open-end splice cap fastened in place with a Buchanan C-24 "pres-SURE" tool. Wires instrumented as such were then pulled through each raceway as indicated in Appendix C.

Once the test article was completed and installation of the thermocouples had been accomplished, the space between the raceways and the blockouts in the concrete slab were filled with normal weight concrete. The test article was then turned over to representatives of PCI/Promatec for installation of their protective wrap systems. Midway through the installation of the cladding on Article 6 (Conduit #9) it was noticed that the instrumented Bare #8 copper conductor has been omitted from that article. Since it was not possible to replace it at that point, the cladding was allowed to continue.

The purchase of all raceway and thermocouple materials, the construction and instrumentation of the test article were all performed under the surveillance of

the OPL in-house QA/QC Department. All fire protective barrier materials were supplied and installed by representatives of PCI/Promatec. A description of the procedures followed can be found in Appendix B, Test Plan and pertinent QC documentation is located in Appendix E, Quality Assurance.

The following table of conduit weights have been included for the convenience of the reader. All of the conduit types were not necessarily included in this project, and all refer to standard rigid aluminum conduit or standard rigid galvanized steel conduit. The other table includes thermal information useful for calculating thermal loadings, etc.

NOMINAL SIZE (IN.)	CONDUIT WEIGHT (lb/ft)	
	RIGID ALUMINUM	RIGID GALVANIZED STEEL
1/2	0.27	0.85
3/4	0.36	1.13
1	0.53	1.68
1 1/2	0.82	2.72
2	1.16	3.65
2 1/2	1.83	5.79
3	2.39	7.58
4	3.40	10.79
5	4.65	14.62
6	6.66	17.45

METAL	THERMAL CONDUCTIVITY $(\frac{W}{m\,K})$	SPECIFIC HEAT $(\frac{J}{kg\,K})$	DENSITY $(\frac{kg}{m^3})$
Aluminum Alloy	186	1042	2770
Carbon Steel	48	559	7854

TEST RESULTS

The completed test specimen was placed against the Laboratory's modified intermediate horizontal fire test furnace, at the OPL's facility at 16015 Shady Falls Rd., Elmendorf, Texas. The thermocouples were then connected to the data acquisition system and their outputs verified.

The test was conducted on March 19, 1998, by Deggary N. Priest, Project Manager, with the following persons present:

Mike Murphy	-	PCI/Promatec
Andy Migas	-	Toledo Edison
Deggary N. Priest	-	Omega Point Laboratories, Inc.
Kerry Hitchcock	-	Omega Point Laboratories, Inc.
Cleda Patton	-	Omega Point Laboratories, Inc.
Richard Beasley	-	Omega Point Laboratories, Inc.
Oscar Estrada	-	Omega Point Laboratories, Inc.

The furnace was fired at 1:32 p.m. and the ASTM E119 standard time-temperature curve followed for a period of 180 minutes. The pressure differential between the laboratory surrounding the furnace and a point within the furnace level with the vertical midpoint of the exposed portion of the specimen was maintained at approximately 0.00 in. water column throughout the test. During the fire exposure, no visual openings into the raceway were observed. Other observations made during the test are as follows:

Time (min:sec)	Observation
0:00	Furnace fired at 1:32 p.m.
2:40	Ignition of tape around various raceway wraps.
3:05	Exposed hardware cloth glowing red.
5:15	A piece of mat on Conduit 1-6 (East end) fell (appears to be a collar section).
8:30	Aluminum tape beginning to melt and fall away.
30:00	No change.
42:00	The outer cover fell away from Junction Box #2.
60:00	No change.
69:00	It was noticed that another layer had fallen from the bottom of JB #2 (exact time that occurred was not determined, but was after 60 minutes. All other visible joints remain intact.

Time (min:sec)	Observation (Continued)
75:00	A loud pop was heard and all of the fiber plug blew out of the hole in the concrete slab through which the thermocouple wires passed from JB#2. The bottom and final layer fell off that junction box. JB #2 is now totally exposed to the furnace heat.
105:00	Separation beginning to become visible between the layers forming the flange (or collar) on JB #1.
120:00	Collars at both ends of the Conduit 1-6 assembly have slid down approximately 1/2" from the concrete slab.
156:00	The wrap system on the trapeze hangers has slid down from the under surface of the concrete slab approximately 1/2".
180:00	Test officially terminated. The furnace was extinguished and the test article was removed and moved by overhead crane to the hose stream test location. There were no obvious openings through to any raceway systems, except for JB #2, which was bare metal. Except for JB#2, all fire protective barrier systems appeared to be firmly attached and in solid condition.
187:33	Hose stream test started.
192:33	The hose stream test was stopped. The specimen did not incur significant damage due to the hose stream test. Except for Article 7 (Junction Box #2), which had no cladding left when it came out of the furnace, all test articles met the requirements of the hose stream test, since no raceway steel was visible.

The test specimen was suspended from an overhead crane and slowly spun (at approximately 6 to 8 revolutions per minute) while being exposed to a hose stream delivered through a 1 1/2 in. fog nozzle with a discharge angle of 30° with a minimum pressure at the nozzle of 75 psi from a distance of 5 feet, for a 5 minute duration. The minimum flow from the nozzle was 75 gpm. The hose stream was thus positioned to attack the sides, bottom and inside vertical surfaces of the test item, with only minimal exposure to the top surface. The test article was lowered and raised several feet occasionally, to allow the application of the hose stream test to as much of the system as possible. This exposure meets the intent of the hose stream application specified in USNRC GL 86-10, Supplement 1.

An in-depth description of the condition of each of the protective envelope systems is presented later in this document.

The significant temperatures within the raceway systems at the end of the prescribed 180 minutes (3 hr) fire exposure are presented in the table below.

LOCATION	INDIVIDUAL		AVERAGE	
	MAX. TEMP. (°F)	MAX. Allowed (°F)	MAX. TEMP. (°F)	MAX. Allowed (°F)
Conduit #1 Bare #8	262	394	226	317
Conduit #1 Surface	293	389	230	311
Conduit #2 Bare #8	226	395	204	317
Conduit #2 Surface	232	388	203	312
Conduit #3 Bare #8	240	394	208	317
Conduit #3 Surface	264	392	215	314
Conduit #4 Bare #8	217	397	197	317
Conduit #4 Surface	208	390	197	312
Conduit #5 Bare #8	262	394	216	317
Conduit #5 Surface	287	390	228	313
Conduit #6 Bare #8	222	396	202	317
Conduit #6 Surface	229	388	202	311
Conduit #9 Surface	292	393	244	317
Conduit #10 Bare #8	403	391	306	316
Conduit #10 Surface	409	396	328	318
Junction Box #1	243	393	306	316
Junction Box #2	1813	388	1684	313
Junction Box #3	253	391	233	316
Trapeze Hangers	1387	395	1075	319

The fire endurance ratings of each article, based on the thermal data above, are presented in the following table.

TEST ITEM	FIRE ENDURANCE RATING (min)
Article 1 (Conduits 1-6)	180
Article 2 (Junction Box #3)	180
Article 3 (Junction Box #1)	180
Article 4 (Conduit #10)	174
Article 6 (Conduit #9)	180
Article 7 (Junction Box #2)	68*

* Article 7 failed prior to the hose stream test when its protective barrier fell off. The fire endurance listed was determined by temperature failure only.

Post-Test Examination

Following the hose stream test and a cooling down period, the test items were systematically disassembled and examined for damage and general condition. A listing of those findings follows.

TEST ITEM	OBSERVATIONS
Article 1 (Conduits #1 - 6 wrapped as a single bundle)	On the horizontal section (West side), the inner three layers of Interam remain blue and undamaged. The next (4th) layer has turned from blue to green, indicating some reaction. The remaining outer layers are completely charred. The raceway steel showed no thermal damage. On the 90° radius (East side), the inner three layers of Interam remain blue and undamaged. The remaining outer layers are completely charred. The raceway steel showed no thermal damage. On the vertical rise section (East side), within six inches of the slab, the inner two layers of Interam remain blue and undamaged. The remaining outer layers are completely charred. The raceway steel showed no thermal damage.
Article 2 (Junction Box #3)	The inner three layers of Interam remain blue and undamaged. The next (4th) layer has turned from blue to green, indicating some reaction. The remaining outer layers are completely charred. The raceway steel showed no thermal damage.
Article 3 (Junction Box #1)	The inner three layers of Interam™ E50 Series Fire Wrap (Interam) remain blue and undamaged. The exposed surface of the outer (third) layer was slightly green. The raceway steel showed no thermal damage.
Article 4 (Conduit #10 1"ø conduit with neighboring 2"ø and 4"ø conduits)	The inner three layers of Interam remain blue and undamaged. The remaining outer layers are completely charred. The raceway steel showed no thermal damage.

TEST ITEM	OBSERVATIONS
Article 5 (Trapeze Hangers)	The outer several layers were tattered and washed away, except around the bands. all inner layers were completely reacted and pure white.
Article 6 (Conduit #9 mounted near the slab)	Under the screen, the inner three layers of Interam are blue and undamaged and the 4th layer had turned green. The remaining outer layers are completely charred. The raceway steel showed no thermal damage. At a location where there was no screen, the inner two layers of Interam are blue and undamaged and the 3rd layer had turned green. The remaining outer layers are completely charred. The raceway steel showed no thermal damage.
Article 7 (Junction Box #2)	All cladding completely gone.

CONCLUSIONS

The raceway items evaluated in this fire exposure test, clad with 3M Interam™ Mat materials as presented herein, met the requirements of the TEST PLAN for fire endurance ratings as indicated below.

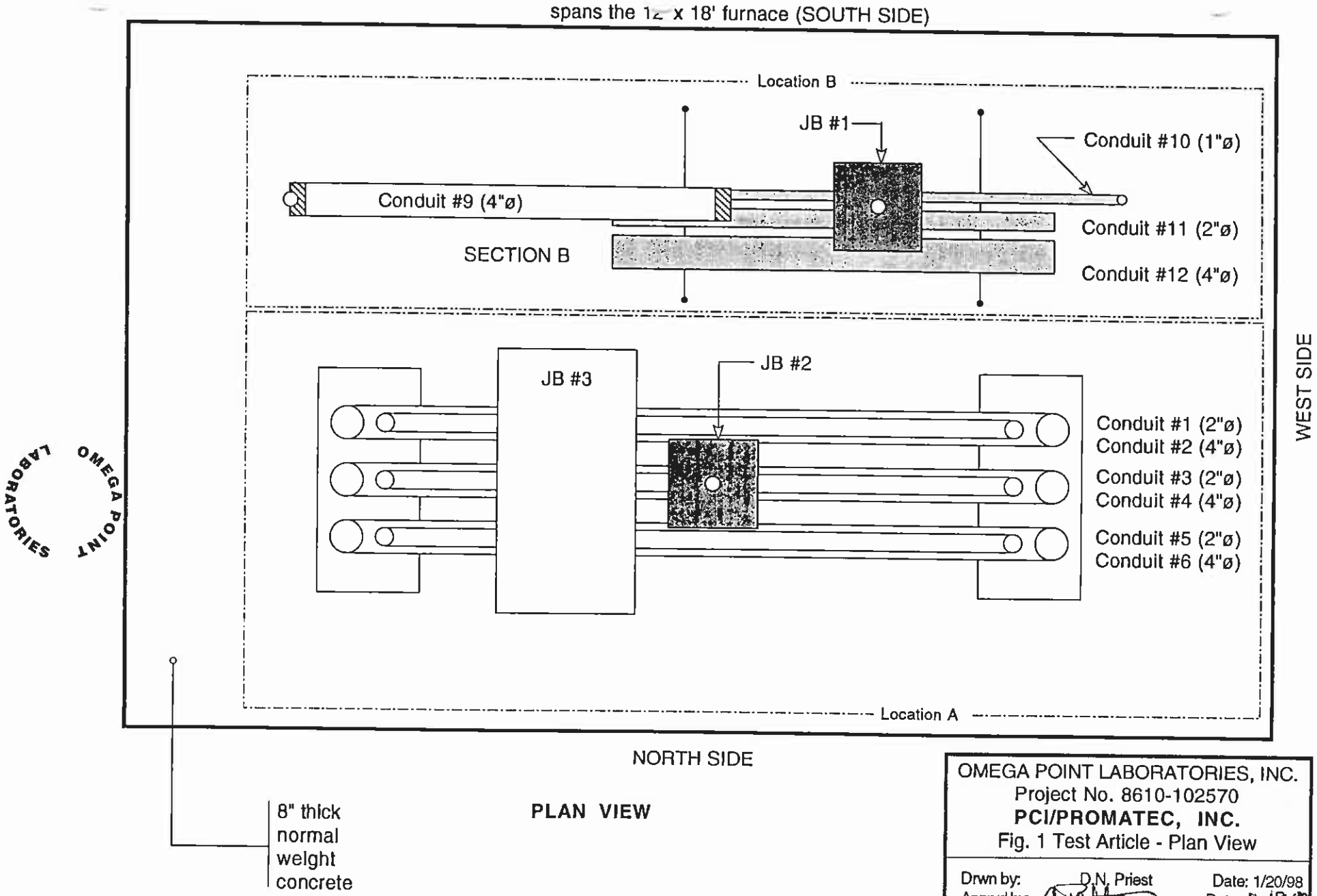
TEST ITEM	FIRE ENDURANCE RATING (min)
Article 1 (Conduits 1-6)	180
Article 2 (Junction Box #3)	180
Article 3 (Junction Box #1)	180
Article 4 (Conduit #10)	174
Article 6 (Conduit #9)	180
Article 7 (Junction Box #2)	68*

* Article 7 failed prior to the hose stream test when its protective barrier fell off. The fire endurance listed was determined by temperature failure only.

Appendix A

CONSTRUCTION DRAWINGS

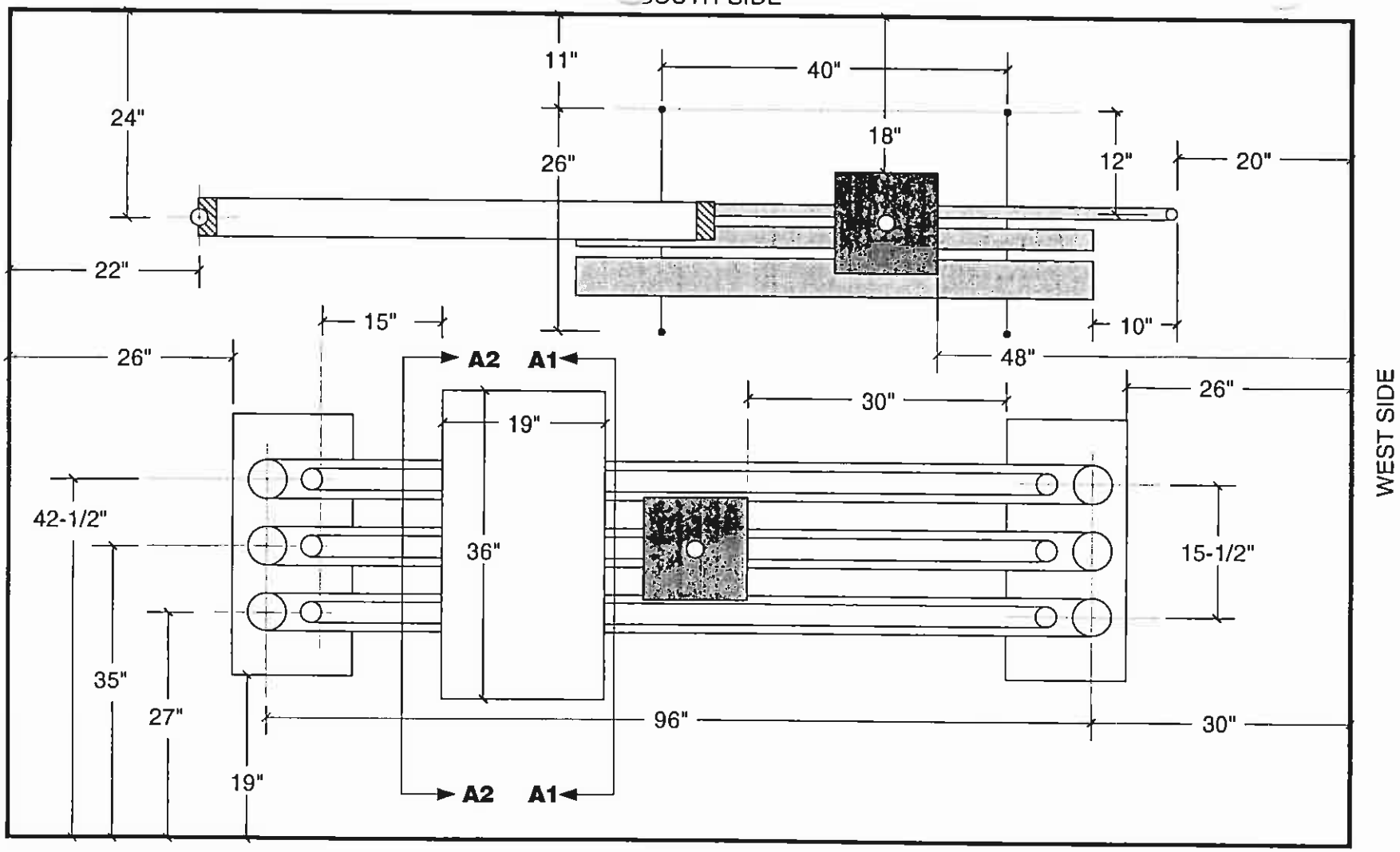
OMEGA POINT LABORATORIES



PLAN VIEW

OMEGA POINT LABORATORIES, INC.	
Project No. 8610-102570	
PCI/PROMATEC, INC.	
Fig. 1 Test Article - Plan View	
Drwn by: D.N. Priest	Date: 1/20/98
Apprvd by:	Date: 5-18-98
PCI/Promatec:	Date: 5/19/98

Scale: 3/4"=1

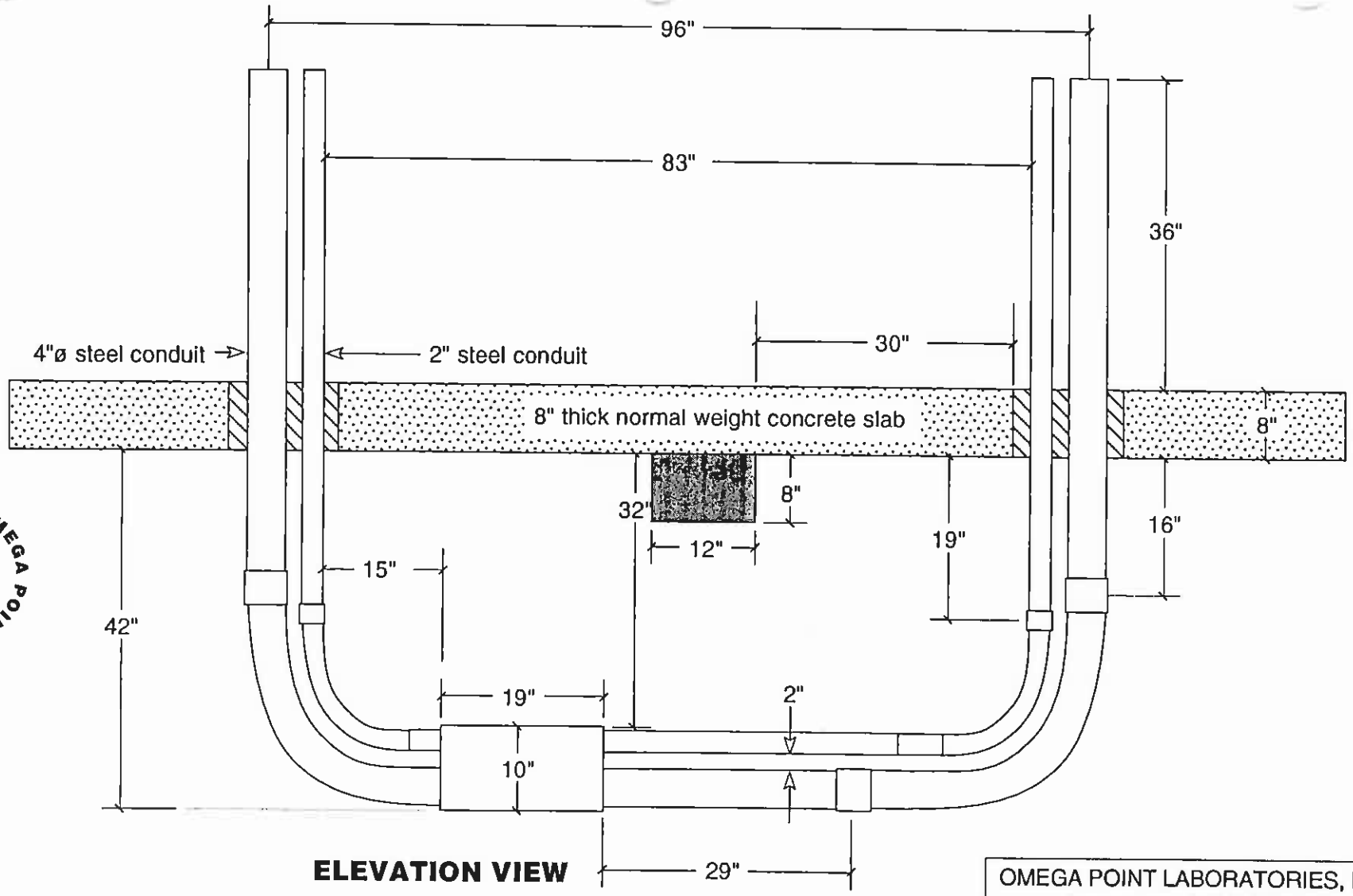


OMEGA POINT LABORATORIES

PLAN VIEW

OMEGA POINT LABORATORIES, INC.		
Project No. 8610-102570		
PCI/PROMATEC, INC.		
Fig. 2 Test Article - Dimensions		
Drwn by:	D.N. Priest	Date: 1/20/98
Apprvd by:	C Patton	Date: 5-18-98
PCI/Promatec:		Date: 5/19/98

Scale: 3/4"=1

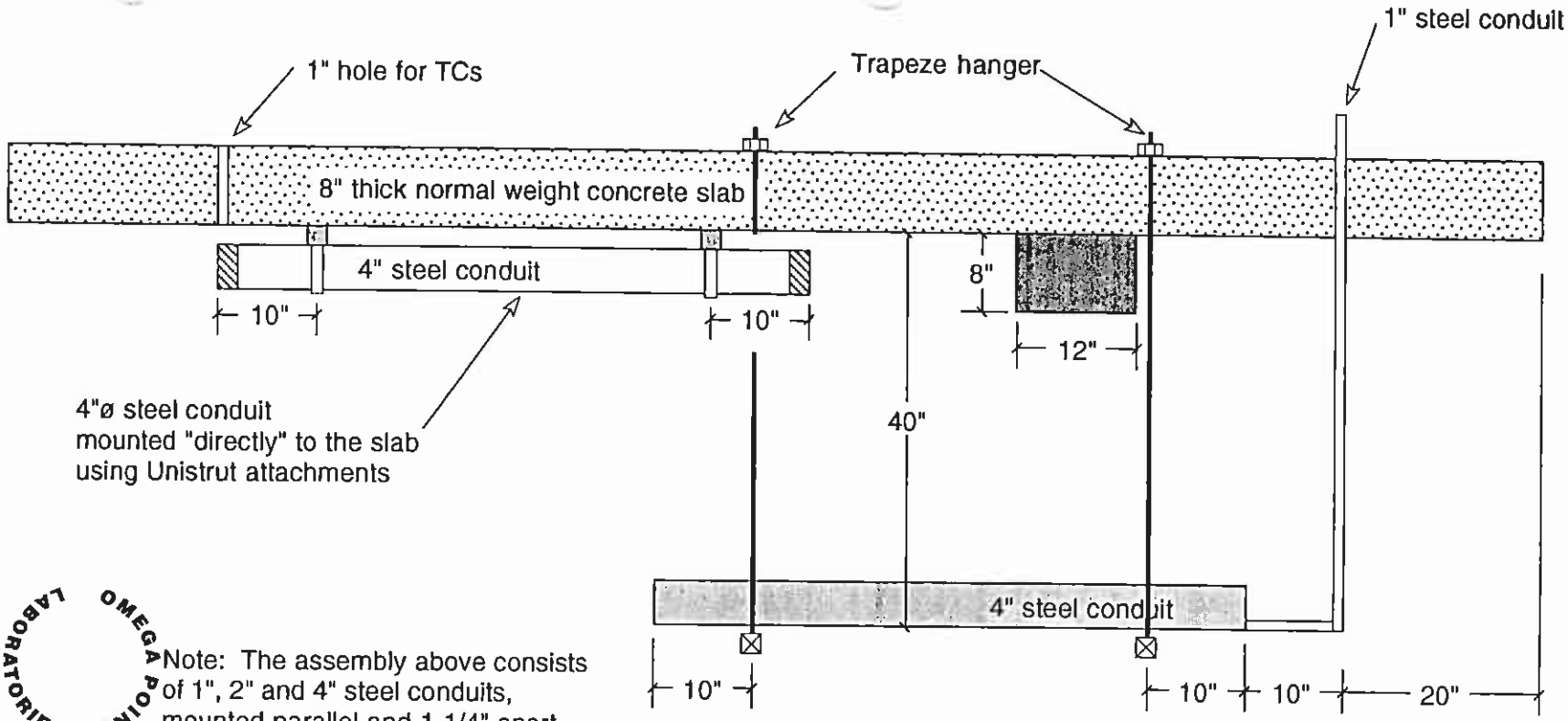


ELEVATION VIEW

OMEGA POINT LABORATORIES

OMEGA POINT LABORATORIES, INC.		
Project No. 8610-102570		
PCI/PROMATEC, INC.		
Fig. 3 Location A		
Drwn by:	D.N. Priest	Date: 1/20/98
Apprvd by:		Date: 5-18-98
PCI/Promatec:		Date: 5/19/98

Scale: 3/4"=1'

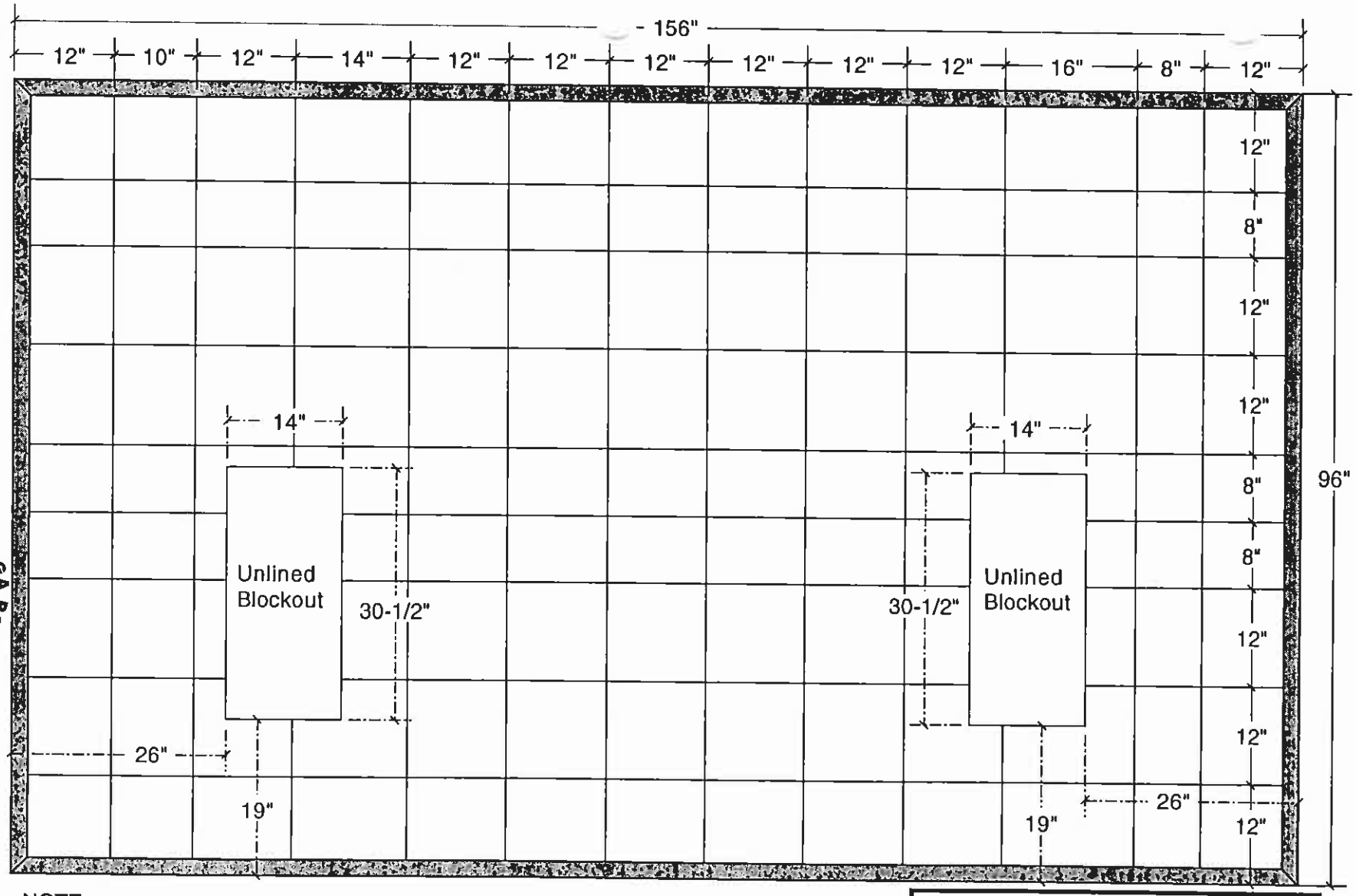


Note: The assembly above consists of 1", 2" and 4" steel conduits, mounted parallel and 1-1/4" apart. The 1" conduit contains a zero radius 90° LB attached to a vertical section of 1" steel conduit to pass the thermocouples out of the system.

SECTION B

OMEGA POINT LABORATORIES, INC. Project No. 8610-102570 **PCI/PROMATEC, INC.** Fig. 4 Location B		
Drwn by:	D.N. Priest	Date: 1/20/98
Apprvd by:		Date: 5-18-98
PCI/Promatec:		Date: 5/19/98

Scale: 3/4"=1'

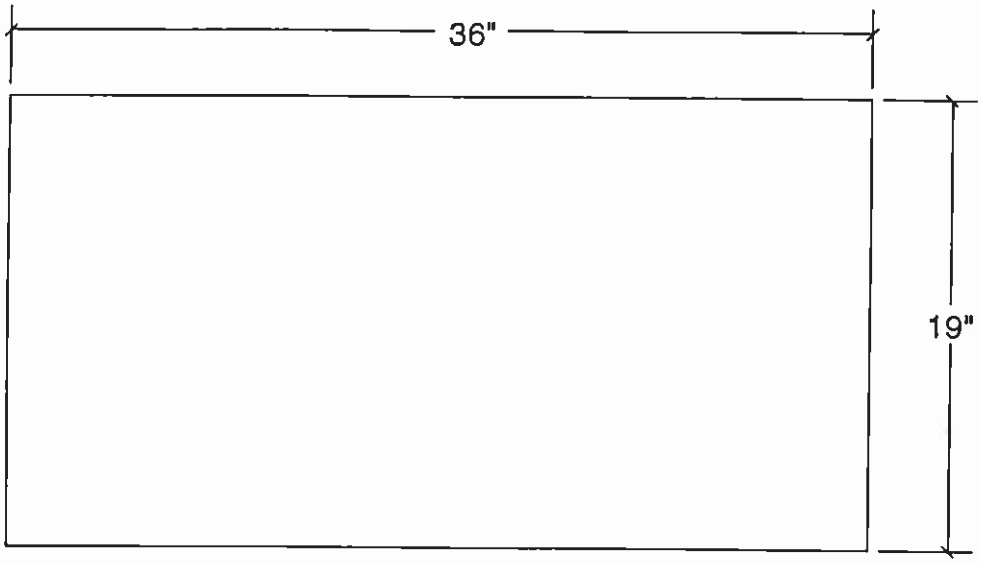


NOTE:
96" x 156" normal weight concrete slab, 8" thick. Perimeter consisted of 8" structural channel, with #5 steel rebars spaces as indicated, with an embedment of 2-1/2".

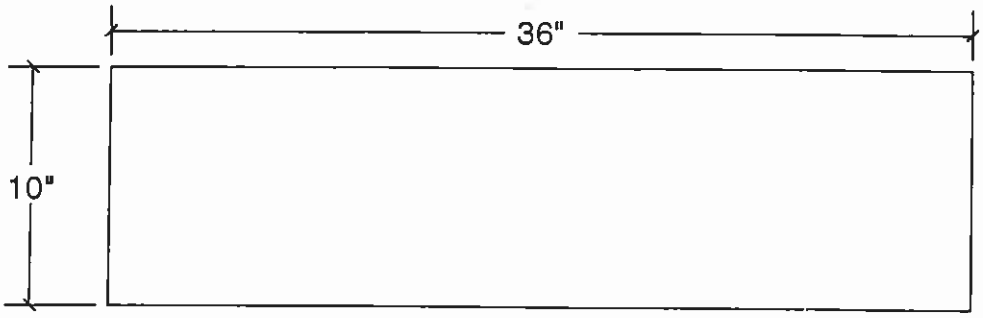
OMEGA POINT LABORATORIES, INC.
Project No. 8610-102570
PCI/PROMATEC, INC.
Fig. 5 Slab Reinforcement Details

Drwn by:	D.N. Priest	Date: 1/20/98
Apprvd by:		Date: 5/18/98
PCI/Promatec:		Date: 5/19/98

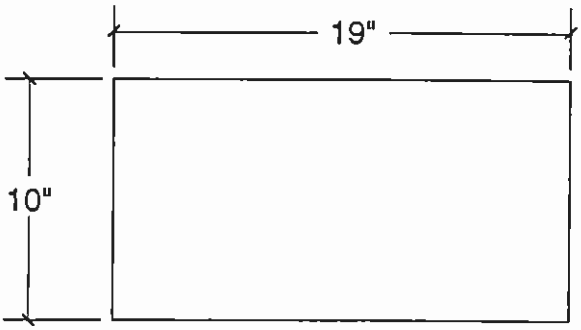
Scale: 3/4"=1'



PLAN VIEW



ELEVATION - SIDE VIEW



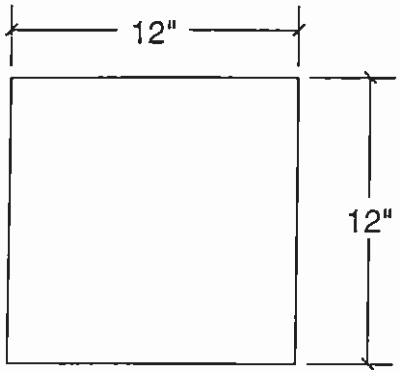
ELEVATION - END VIEW

NOTE:
Junction box was manufactured of 14 GA bare sheet steel with continuously-welded joints. Top was removable, with attachment by screws, spaced approximately 6-8" o.c. (not critical).

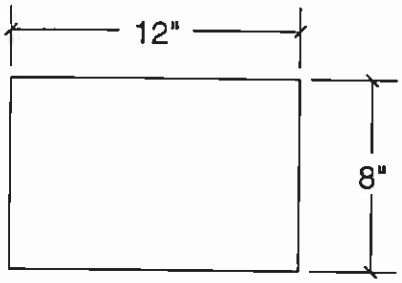
OMEGA POINT LABORATORIES, INC. Project No. 8610-102570 **PCI/PROMATEC, INC.** Fig.6 Junction Box #3 Location A		
Drwn by:	D.N. Priest	Date: 1/20/98
Apprvd by:		Date: 5/18/98
PCI/Promatec:		Date: 5/19/98

Scale: 1-1/2"=1'

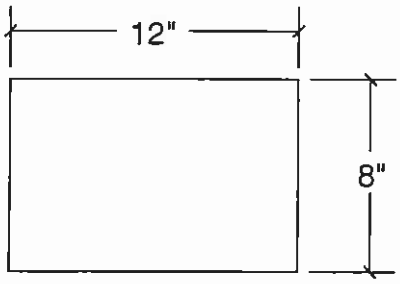
OMEGA POINT LABORATORIES



PLAN VIEW



ELEVATION - END VIEW



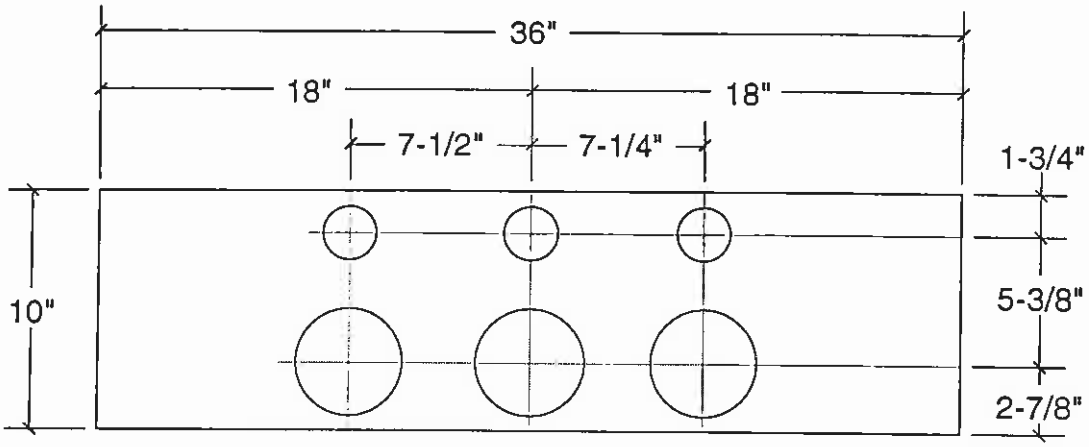
ELEVATION - SIDE VIEW

NOTE:
Junction boxes were manufactured of 14 GA bare sheet steel with continuously-welded joints. The tops were removable, with attachment by screws, spaced two per edge.

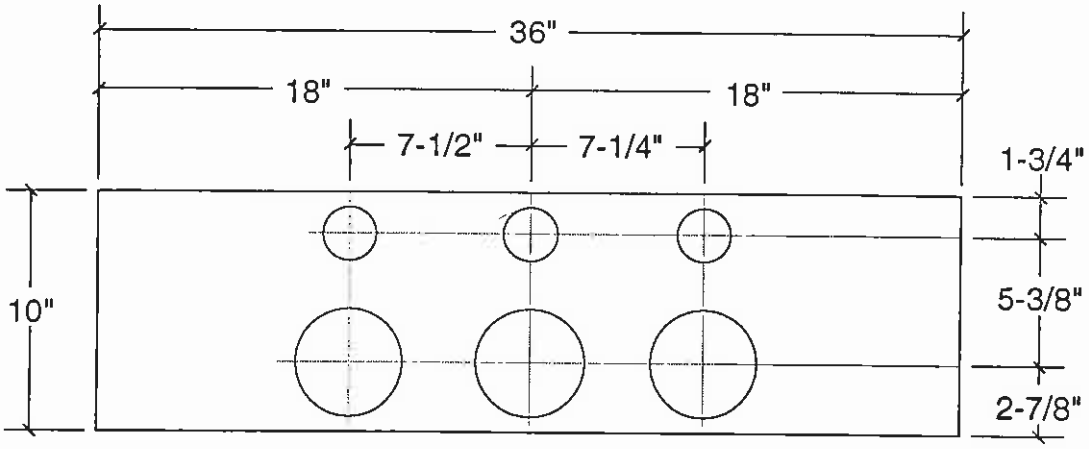
OMEGA POINT LABORATORIES, INC. Project No. 8610-102570 **PCI/PROMATEC, INC.** Fig.7 Junction Boxes #1 & #2 Sections A & B		
Drwn by:	D.N. Priest	Date: 1/20/98
Apprvd by:		Date: 5/18/98
PCI/Promatec:		Date: 5/19/98

Scale: 1-1/2"=1'

OMEGA POINT LABORATORIES



SECTION A1-A1



SECTION A2-A2

OMEGA POINT LABORATORIES, INC. Project No. 8610-102570 PCI/PROMATEC, INC. Fig. 8 Sections A1-A1 & A2-A2	
Drwn by: D.N. Priest	Date: 1/30/98
Apprvd by: C Patton	Date: 5/18/98
PCI/Promatec:	Date: 5/19/98

Scale: 1-1/2"=1'

OMEGA POINT LABORATORIES

Appendix B

TEST PLAN

OMEGA POINT LABORATORIES

PEAK SEALS INC.

TEST PLAN NO. CTP-2009

THREE (3) HOUR FIRE ENDURANCE TEST

3M INTERAM™ FIRE WRAP

Rev	Date	By	Approved	Issue Date	Comments
5	6/12/98	M. Murphy	L.C. Spriggs	6/12/98	Final As Built

TEST PLAN NO. CTP-2009

THREE (3) HOUR FIRE ENDURANCE TEST

3M INTERAM™ FIRE WRAP

1.0 PURPOSE

1.1 The purpose of this test is to qualify various configurations of 3M Interam™ E50 series fire wrap systems for a three hour rating in accordance with criteria established by the USNRC in Generic Letter GL-86-10, Supplement 1. This test will be performed and the results reported by a third-party test laboratory. The configurations to be tested are intended to qualify the following raceways and size ranges:

- Multiple rigid steel conduit bank consisting of 3 - 4" and 3 - 2".
- Steel junction box 36" x 19" x 10"
- 2 Steel junction boxes 12" x 12" x 8" each with one face against concrete.
- Steel conduit with multiple interfering items
- Trapeze hanger configuration consisting of ½"-13 threaded rod and P-1001 Unistrut.
- Steel conduit 4" in diameter proximate to concrete.

2.0 SCOPE

2.1 Test outline, including individual raceway configurations, sizes, applicable test standards, acceptance criteria, barrier wrap designs and reporting requirements.

2.2 Procedures for installation of 3M Interam™ fire wrap systems.

2.3 Procedures for quality verification of wrap installation, including material receipt and traceability, in-process inspection and final inspection.

2.4 Reporting and final test report requirements.

3.0 APPLICABLE DOCUMENTS

3.1 USNRC Generic Letter GL-86-10, Supplement 1, "Fire Endurance Test Acceptance Criteria For Fire Barrier Systems Used To Separate Redundant Safe Shutdown Trains Within The Same Fire Area".

3.2 ASTM E119-88, Standard Methods of Fire tests of Building Construction and Materials.

3.3 Promatec Quality Assurance Program Manual, Revision D, Dated June 28, 1995.

4.0 DEFINITIONS

4.1 Interam™ E50 series mat: Flexible endothermic wrap system manufactured by 3M Company for the separation and protection of redundant cables and equipment in nuclear power facilities (individual component and composite system descriptions are detailed in the body of this test plan).

4.2 Third-Party Testing Laboratory: A nationally recognized and independent testing organization capable of performing fire endurance and other tests for the purpose of qualifying systems and designs in accordance with governing codes and applicable standards.

4.3 Qualification Fire Test: A fire endurance test conducted at a third party test laboratory intended to provide objective and documentary evidence that the system tested meets the performance requirements of governing codes and standards.

4.4 Preliminary Test Report: A synopsis of the test, issued by the third-party test laboratory. Information reported includes test deck and raceway descriptions, observances made during the course of the test, thermocouple temperature data, basic drawings and sketches of the test assembly, hose stream results and preliminary conclusions.

4.5 Final Test Report: A detailed report issued by the third-party test laboratory that includes all relevant information applicable to the test including, but not limited to:

4.5.1 Detailed discussion on test purpose and scope.

4.5.2 Written description and drawings of raceway components used, configurations of the raceways and orientation of the test deck.

4.5.3 Specification of thermocouples and drawings showing the number and actual location of each thermocouple.

4.5.4 Furnace and test deck description.

4.5.5 Systems and applications methods observed and verified by the third-party quality assurance organization during installation.

4.5.6 Observances made on system behavior during the course of the fire; after removal from the furnace, prior to the hose stream and after the hose stream test.

4.5.7 Complete thermocouple data in tabular and graph form.

4.5.8 Complete quality assurance documentation of the overall test process, including material certifications, inspection reports and photographs.

4.5.9 Detailed discussion on the results and conclusions drawn from the fire and hose stream test.

4.6 Longitudinal joint: A joint (or seam) which runs parallel to the item being protected.

4.7 Perimeter joint: A joint (or seam) which runs perpendicular to the item being protected.

4.8 Butt Joint: A joint (or seam) where the edges of two adjacent pieces of the same layer meet with no overlap.

4.9 Through Joint: A joint (or seam) where each layer terminates at the same location at a given butt joint.

4.10 Overlap Joint: A joint (or seam) where a piece of a given layer overlaps onto the same layer piece adjacent to it.

4.11 Offset Joint: A butt joint (or seam) that is staggered in its location from the butt joint occurring in the layer *above* or *below* it. (See also Through Joint).

4.12 Two Piece Wrap Method: An installation method whereby each layer is installed in two distinct pieces. (This method is normally employed for smaller diameter conduits at radial bends.)

4.13 Four piece Wrap Method: An installation method whereby each layer is installed in four distinct pieces. (This method is normally employed for larger diameter conduits and cable trays at radial bends.)

4.14 Circumference Wrap Method: An installation method whereby each layer of the mat is installed around the circumference or perimeter of the protected item in a continuous piece. At the longitudinal joint formed where the two edges of the mat meet an overlap is normally incorporated.

4.15 One Piece Corner Method: An installation method intended for a sharp transition (e.g. the horizontal to vertical transition at a condulet or corner of a support) whereby the transition is covered with a single piece of material. This type of pattern normally results in a longitudinal butt joint or overlap joint at the inside bend of the transition and a diagonal joint on each side of the item covered.

4.16 Modified One Piece Corner: An installation method intended for a sharp transition (e.g. the horizontal to vertical transition at a condulet or corner of a support) whereby the transition is covered with two or more pieces of material. This type of pattern normally results in a single heel piece, and one or more throat pieces. Longitudinal butt joints normally occur where the heel and throat pieces meet

4.17 Two Piece Corner Method: An installation method intended for a sharp transition (e.g. the horizontal to vertical transition at a condulet or corner of a support) whereby the transition is covered with two distinct pieces. One piece

is used for the horizontal portion, and the other is used for the vertical portion of the transition. The point at which the two pieces meet is mitered, forming the corner of the transition. This pattern normally results in a longitudinal overlap joint at the inside bend of the transition.

4.18 Collar: A strip of material of a minimum width which is utilized to cover final layer perimeter butt joints.

4.19 Cover Strip: A strip of material of a minimum width which is utilized to cover final layer butt joints which do not receive a collar.

4.20 Caulk: 3M Fire Dam-150, Dow Corning 732 Multi Purpose Sealant; These caulks may be used interchangeably except where specifically noted otherwise.

4.21 Tape: 3M T-49 Aluminum Tape

4.22 Strut: B-Line B72 galvanized steel channel 13/16" wide x 13/32" deep x 18 ga., .26 LB/ft.

4.23 Standoffs: (spacers) Thin strips of mat 2" (-1/2" + 0") applied to the article around the perimeter or longitudinally to provide a space between the article and the mat or between two adjacent layers of mat.

5.0 RESPONSIBILITIES

5.1 **Peak Seals** shall be responsible for the following:

5.1.1 Supply of wrap system components, craft labor for wrap installation, and quality inspection of wrap installation activities.

5.1.2 Developing and issuing test plans that provide detailed information on the test purpose, items to be tested, wrap system designs to be used, installation procedures and quality control requirements.

5.1.3 Installation of fire barrier wrap systems in accordance with procedures and drawings provided in this test plan.

5.1.4 Inspection and documentation of material receipt, in-process installation and final verification in accordance with procedures provided with this test plan.

5.2 **The third-party test laboratory** shall be responsible for the following:

5.2.1 Supply of facilities, test decks, raceway components, thermocouples, wire, furnace, instrumentation, measuring equipment and technicians for construction and test activities.

5.2.2 Construction of the test decks and installation of raceways, penetration seals, cables and supports.

5.2.3 Installation and instrumenting of thermocouples in accordance with the requirements of Generic Letter GL-86-10, Supplement 1.

5.2.4 Quality Assurance monitoring and documentation during test deck assembly, thermocouple placement, wrap system installation, fire test performance, hose stream test and post test examination.

5.2.5 Actual performance of fire endurance and hose stream test.

5.2.6 Post-fire dissection and observances.

5.2.7 Preparation and issuance of preliminary and final test reports.

6.0 WRAP MATERIALS

Component	***Application***
Interam™ E54A Mat	Primary wrap system.
Dow Corning 732 adhesive/sealant	Filling gaps and seams and at barrier terminations
FireDam™ FD-150 Caulk	Filling gaps at seams and at support terminations.
T-49 Aluminum Foil Tape	Securing overlap joints, covering exposed mat and caulk at edges and seams.
1/2" Stainless Banding and Clips	Securement of final mat layer.
FS-2000+ Caulk	Securement of 1st and 2nd layers of Article 3
3/4" Stainless Banding and Clips	Securement of final mat layer in conjunction with anchor bolts.
½ x 0.063 Carbon Steel Mesh	Securement of final mat layer.
HDI ¼ " concrete anchors	Securement of final mat layer when interfacing with substrate.
Refractory Ceramic Fiber	Mat Terminations

7.0 TEST ASSEMBLY

7.1 Test Deck

The test deck shall be constructed of concrete and shall have the approximate dimensions of 13' x 8' x 8". Individual blockouts shall be coredrilled or otherwise formed for each raceway penetration as necessary.

7.2 Raceway Configurations:

7.2.1 ***Article 1***: Multiple rigid steel conduit bank consisting of 3 - 4" and 3 - 2".

The 3 - 4" conduit are to be constructed in a standard U-shaped configuration with the conduits adjacent to one another on a horizontal plane with dimensions of 96" horizontal by approximately 36" vertical. 90° short radius elbows are to be used for the radius sweep on both ends The

2" conduits will also be adjacent to one another on a horizontal plane, and situated above and on the inside of the "U" formed by the 4" conduits.

A single AWG #8 stranded wire is to be inserted the full length through each conduit for internal thermocouple placement. The conduit shall not contain cable.

7.2.2 ***Article 2***: Steel junction box 36" x 19" x 10"

The Steel junction box is to be part of the conduit configuration described above. It will be situated along the horizontal portion of the conduit run, immediately adjacent to the radius at one end.

7.2.3 ***Article 3.*** Steel junction box 12" x 12" x 8" with one face against concrete.

7.2.4 ***Article 4.*** Rigid steel conduit with multiple interfering items.

The primary conduit will be 1" in diameter and 60" in length. An LB condulet and vertical conduit section will be used at the horizontal-to-vertical transition at one end only as a means to allow egress of the thermocouple leads from the furnace. The conduit will be situated adjacent to a 2" and a 4" rigid steel conduit along a horizontal plane. The proximity and position of these conduits will be such that the 2" and 4" will be incorporated at various layers into the envelope protecting 1" conduit.

A single AWG #8 stranded wire is to be inserted the full length through the 1" conduit for internal thermocouple placement. None of the conduit shall contain cable.

7.2.5 ***Article 5.*** Trapeze hanger configuration consisting of ½"-13 threaded rod and P-1001 Unistrut.

The trapeze hanger will be part of the conduit configuration described above. Conduits may be welded to the hangers in lieu of using clamps or straps.

7.2.6 ***Article 6***: Rigid steel conduit 4" in diameter proximate to concrete.

The conduit is to be horizontal and 60" in length and shall be mounted to the concrete deck with P-1001 Unistrut.

7.2.7 ***Article 7.*** Steel junction box 12" x 12" x 8" with one face against concrete.

7.3 **Wrap System Attributes**

7.3.1 <u>Article 1 - Multiple rigid steel conduit bank</u>

- Five layers of E-54A (0.4" Nominal Thickness) shall be used. For additional detail of construction see section 9.0.

7.3.2 Article 2 - Steel junction box 36" x 19" x 10"

- Six layers of E-54A (0.4" Nominal Thickness) shall be used. For additional detail of construction see section 9.0.

7.3.3 Article 3 - Steel junction box 12" x 12" x 8"

- Six layers of E-54A (0.4" Nominal Thickness) shall be used. For additional detail of construction see section 9.0.

7.3.4 Article 4 - 1" Rigid steel conduit

- Five layers of E-54A (0.4" Nominal Thickness) shall be used. For additional detail of construction see section 9.0.

7.3.5 Article 5 - Trapeze hanger

- Five layers of E-54A (0.4" Nominal Thickness) shall be used for a distance of 12" from the critical item. Four layers shall be used for the remainder of the length. For additional detail of construction see section 9.0.

7.3.6 Article 6 - 4" Rigid Steel Conduit

- Five layers of E-54A (0.4" Nominal Thickness) shall be used. for additional detail of construction see section 9.0.

7.3.7 Article 7 - Steel junction box 12" x 12" x 8"

- Six layers of E-54A (0.4" Nominal Thickness) shall be used. For additional detail of construction see section 9.0.

8.0 THERMOCOUPLE REQUIREMENTS

8.1 Thermocouple Placement

8.1.1 Conduits

- Every 6" along the bottom external surface of the conduit.
- Every 6" along the bare #8 wire inside the conduit.
  - Note: A bare #8 wire was not installed in the 2" & 4" conduits of article 4 or in the 4" conduit of article 6..

- Immediately adjacent to supports.

8.1.2 Junction Boxes

- One thermocouple for every square foot of surface area with a minimum of one thermocouple geometrically centered on each inside surface .
- On the JB surface within 1" distance of the conduit at both the point of entry and the point of exit.

8.1.3 Trapeze Hanger

- Two thermocouples located on each of the two vertical all-thread components of the trapeze hanger at approximate 1/3 points along their length.

8.2 **Thermocouple Groups**

Temperature conditions on the unexposed surface of the fire barrier shall be determined by averaging all thermocouples measured in a specific group. Thermocouple groups are defined as follows:

8.2.1 Conduit

- External conduit surface.
- #8 bare wire inside conduit.

8.2.2 Junction Boxes

- Average of all thermocouples

9.0 INTERAM™ INSTALLATION PARAMETERS

9.1 Craft, as required, shall be indoctrinated and trained in accordance with the Peak Seals training program for Interam™. Training shall be documented in accordance with the Promatec Quality Assurance Program.

9.2 Install the wrap systems in accordance with guidelines established below .

Note:

- The wrap shall abut to the test deck, for articles 1, 3, 5, 6 and the inner three layers of article 7. The wrap shall be sealed at the concrete interface for each layer with D.C. 732 Multi Purpose Sealant or 3M FD 150 where necessary for gaps greater than 1/8" and up to 3/8". Gaps greater than 3/8" are not permitted.
- Butt joints are reasonably tight with gaps not exceeding 3/8".
- Gaps greater than 1/8" and up to 3/8" shall be caulked with 3M FD-150 or D.C. 732 Multi Purpose Sealant.
- Each layer upon installation shall be numbered for layer identification.

- Except on supports, exposed mat such as longitudinal joints, and perimeter joints shall be covered with tape for each layer installed. On the final layer, terminations, edges of collars, cover strips and joints of support wrap shall also be taped.

- For primary items, (conduits ,cable trays, etc.) 1/2" x 0.020 stainless steel banding shall be installed 12" on center (+1" -0") (minimum one band per piece) and within 1" of the edge of all collars. (Min. two bands required per collar.) and within 2" of all final layer butt joints and overlap joints where collars have not been applied.

- Where banding is used in conjunction with anchor bolts, a 3/4" width band shall be used.

- Supports shall be banded 12" on center (+1/2" -0") (minimum one band per piece) and within 2" of offset or butt joints and terminations. At the intersection of the support and the primary item criss-cross banding shall be applied. Banding may be secured to the Unistrut.

9.3 *Article 1*: Multiple rigid steel conduit bank consisting of 3 - 4" and 3 - 2".

9.3.1 See notes at the beginning of this section.

9.3.2 Five layers of E-54A (0.4" Nominal Thickness) shall be used.

9.3.3 Standoffs shall be used before application of the first layer of mat and after the application of the second layer.

9.3.3.1 Standoffs shall be applied to the article at intervals not to exceed 15" and as necessary to maintain the required airspace. In addition, standoffs shall be required under butt joints, and adjacent to conduit straps and couplings.

VERTICAL & HORIZONTAL SECTIONS:

9.3.4 For the vertical, horizontal and radial bend sections of this conduit, the material shall be applied using the four piece wrap method.

9.3.4.1 The edges of the third and fourth pieces applied shall over lap the edges of the first and second pieces applied by 2" (-1/2" + 0").

Note: The 1-1/2" to 2" overlap on each side may be "V" notched or slit as necessary to permit the overlap portion to lay flat against the third and fourth sides, and shall be caulked with a nominal 1/4" bead at the "V" notches after installation.

9.3.5 Adjacent sections of the same layer shall be abutted (see butt joint definition) to one another resulting in 2" (-1/2" + 0") offset joints for subsequent layers applied, except at the transition to the radial bend from the vertical and horizontal portion of the conduit run and junction box.

TRANSITIONS:

9.3.6 Transitions to the radial bend from the horizontal and vertical portions of the conduit run and junction box may be perimeter through joints, and shall be taped at each layer and caulked with a nominal 1/4" bead and, where necessary for gaps greater than 1/8" and up to 3/8". Gaps greater than 3/8" are not permitted.

9.3.7 4" (-0" + 1/2") wide collars shall be installed over all final layer perimeter butt joints.

9.3.7.1 The collar shall have a longitudinal overlap of 2" (-1/2" + 0")

9.3.8 4" (-0" + 1/2") two layer collars shall be applied at the concrete/mat interface.

9.3.8.1 The collars shall have a longitudinal overlap of 2" (-1/2" + 0")

9.3.8.2 The collars shall abut tightly to the concrete, and shall be caulked at the concrete/mat interface with D.C. 732 Multi Purpose Sealant or FD-150 caulk.

9.3.9 See notes at the beginning of this section.

9.4 *Article 2*: Steel junction box 36" x 19" x 10"

9.4.1 See notes at the beginning of this section.

9.4.2 Six layers of E-54A (0.4" Nominal Thickness) shall be used.

9.4.3 Standoffs shall be used after application of the second layer of mat.

9.4.3.1 Standoffs shall be applied to the article at intervals not to exceed 15" and as necessary to maintain the required airspace. In addition, standoffs shall be required under butt joints, and adjacent to conduit straps and couplings.

9.4.4 The mat shall be applied using the four piece wrap method.

9.4.4.1 The third and fourth pieces, for each layer applied to the sides of the box, shall overlap the first and second pieces applied by the thickness of the mat.

9.4.4.2 Top and bottom pieces shall overlap the side pieces applied by the thickness of the mat.

9.4.4.3 Each joint shall be taped. *Except* for the final layer.

9.4.5 The final layer (sixth), shall overlap the perpendicular side by 4" (-1/2" + 0")

9.4.6 The top and bottom pieces shall be cut a width and length necessary to cover the item, ***plus an additional 8"***

9.4.6.1 The pieces above shall be centered over the top and bottom of the item providing a 4" (-1/2" + 0") overlap onto the sides.

9.4.6.2 The final layer side pieces shall be applied over the overlap of the top and bottom pieces.

9.4.6.3 The overlap shall be banded with 1/2" x 0.020 stainless steel banding within 1" of the edge.

9.4.7 See notes at the beginning of this section.

9.5 *Article 3.* Steel junction box 12" x 12" x 8" with one face against concrete

9.5.1 See notes at the beginning of this section.

9.5.2 Six layers of E-54A (0.4" Nominal Thickness) shall be used.

9.5.3 Standoffs shall be used after application of the second layer of mat.

9.5.3.1 Standoffs shall be applied to the article at intervals not to exceed 15" and as necessary to maintain the required airspace.

9.5.4 The mat shall be applied using the four piece wrap method.

9.5.4.1 Adjacent pieces which are applied perpendicular to one another shall overlap by the thickness of the mat.

9.5.4.2 Bottom piece shall overlap the side pieces applied by the thickness of the mat. The final layer shall overlap onto the sides by 3" (+1"-0")

9.5.4.3 FS-2000+ caulk may be used as a construction aid where deemed necessary.

9.5.5 The mat shall abut the concrete at the junction box/deck interface, and after the installation of the final layer shall be banded prior to the installation of the collars described below.

9.5.6 4" (-0" + 1/2") two layer collars shall be applied at the concrete/mat interface.

9.5.6.1 The collars shall have a longitudinal overlap of 2" (-1/2" + 0")

9.5.6.2.1 The collars shall abut tightly to the concrete, and shall be caulked at the concrete/mat interface with D.C. 732 Multi Purpose Sealant or FD-150 caulk.

9.5.6.3.1 Refractory Ceramic Fiber may be used to fill small voids which occur between the collar and the box.

9.6 *Article 4.* Rigid steel conduit with multiple interfering items.

9.6.1 See notes at the beginning of this section.

9.6.2 Five layers of E-54A (0.4" Nominal Thickness) shall be used.

9.6.3 Standoffs shall be used before application of the first layer of mat and after the application of the second layer.

9.6.3.1 Standoffs shall be applied to the article at intervals not to exceed 15" and as necessary to maintain the required airspace. Standoffs shall be required under subsequent layer butt joints, and adjacent to conduit straps and couplings.

VERTICAL & HORIZONTAL SECTIONS:

9.6.4 The material shall be applied using the circumference wrap method. As many of the required layers as possible shall be installed around the critical item (1" RSC) before encompassing the adjacent conduits.

9.6.4.1 Each layer of the circumference wrap method shall have an overlap joint of 4" (-1/2" + 0") These joints may occur at any point around the item.

9.6.5 Adjacent sections of the same layer shall be abutted (see butt joint definition) to one another resulting in 2" (-1/2" + 0") offset joints for subsequent layers applied,

CONDULET:

9.6.6 For the condulet portion of the conduit run the material shall be applied using the one piece corner method.

9.6.6.1 The resulting diagonal and longitudinal butt joint shall be caulked with a nominal 1/4" bead and taped each layer. Overlap joints do not require caulk.

9.6.7 4" (-0" + 1/2") wide collars shall be installed over all final layer perimeter butt joints.

9.6.8 2" (-0" + 1/2") wide cover strips shall be installed over all final layer butt joints which do not receive a collar.

9.6.9 4" (-0" + 1/2") two layer collars shall be applied at the concrete/mat interface.

9.6.9.1 The collars shall have a longitudinal overlap of 2" (-1/2" + 0")

9.6.9.2 The collars shall abut tightly to the concrete, and shall be caulked at the concrete/mat interface with D.C. 732 Multi Purpose Sealant.

TERMINATIONS:

9.6.10 At the point of termination of the wrap, the open end shall be sealed flush with the termination of the wrap:

9.6.10.1 Multiple layers of mat minimum 4" wide, stacked to fill the cross-sectional area of the opening.

9.6.10.2 Voids and gaps filled between pieces and around edges with FD-150.

9.6.11 See notes at the beginning of this section.

9.7 *Article 5.* Trapeze support constructed of P-1001 Unistrut & ½"-13 threaded rod.

9.7.1 See notes at the beginning of this section.

9.7.2 The application of the mat to the protected items (conduit) shall be completed prior to the application of mat to the support.

9.7.3 The entire length of the support shall be protected both vertically and horizontally. Five layers of E-54A (0.4" Nominal Thickness) shall be used within 12" of the critical item (1" RSC), the remainder of the length shall be protected with four layers of E-54A.

9.7.4 The material shall be applied using the circumference wrap method.

9.7.5 Each layer of the circumference wrap method shall have an overlap joint of 4" (-1/2" + 0") These joints may occur at any point around the item.

9.7.6 Adjacent sections of the same layer shall be abutted (see butt joint definition) to one another resulting in 2" (-1/2" + 0") offset joints for subsequent layers applied.

9.7.7 4" (-0" + 1/2") two layer collars shall be applied at the concrete/mat interface.

9.7.7.1 The collars shall have a longitudinal overlap of 2" (-1/2" + 0")

9.7.7.2 The collars shall abut tightly to the concrete, and shall be caulked at the concrete/mat interface with D.C. 732 Multi Purpose Sealant or FD-150 caulk.

9.7.8 See notes at the beginning of this section.

9.8 *Article 6*: Rigid steel conduit 4" diameter, proximate to concrete.

9.8.1 See notes at the beginning of this section.

9.8.2 Five layers of E-54A (0.4" Nominal Thickness) shall be used.

9.8.3 Standoffs shall be used before application of the first layer of mat and after the application of the second layer.

9.8.3.1 Standoffs shall be applied to the article at intervals not to exceed 15" and as necessary to maintain the required airspace. In addition, standoffs shall be required under butt joints, and adjacent to conduit straps and couplings.

HORIZONTAL SECTION:

9.8.4 The material shall be applied using the circumference wrap method. As many of the required layers as possible shall be installed around the critical item (4" RSC) before flaring the mat onto the concrete deck.

9.8.4.1 Each layer of the circumference wrap method shall have an overlap joint of 4" (-1/2" + 0") These joints may occur at any point around the item.

9.8.5 Adjacent sections of the same layer shall be abutted (see butt joint definition) to one another resulting in 2" (-1/2" + 0") offset joints for subsequent layers applied,

9.8.6 The mat shall be flared onto the concrete a min. of 2" as necessary after all of the required layers have been applied around the conduit as possible. The flared mat shall be secured with Hilti Drop-In anchors and ¼"-20 threaded rod studs with nuts and washers. The spacing shall be between 5" min. to 21" max. The edge of the material shall be impaled over the fasteners and secured with strut.

9.8.7 See notes at the beginning of this section.

9.9 *Article 7.* Steel junction box 12" x 12" x 8" with one face against concrete

9.9.1 See notes at the beginning of this section.

9.9.2 Six layers of E-54A (0.4" Nominal Thickness) shall be used.

9.9.3 Standoffs shall be used after application of the second layer of mat.

9.9.3.1 Standoffs shall be applied to the article at intervals not to exceed 15" and as necessary to maintain the required airspace. In addition, standoffs shall be required under butt joints, if they occur.

9.9.4 The mat shall be applied using the four piece wrap method.

9.9.4.1 Adjacent pieces which are applied perpendicular to one another shall overlap by the thickness of the mat.

9.6.4.2 Bottom piece shall overlap the side pieces applied by the thickness of the mat for the first three layers applied. For the final three layers the bottom may be contiguous with the side pieces, otherwise the final bottom layer shall overlap onto the sides by 3" (+1"-0")

9.9.5 The mat shall flare onto the concrete at the junction box/deck interface, for the final three layers, by a minimum of 2". The flared mat shall be secured with Hilti Drop-In anchors and ¼"-20 threaded rod studs with nuts and washers. The spacing shall be at intervals not to exceed 21" max. The edge of the material shall be impaled over the fasteners and secured with strut.

10.0 INTERAM™ SYSTEM INSPECTION CRITERIA

10.1 Prior to use, receipt inspect all materials in accordance with procedure no. QCP-0050, "Receiving, Handling, and Storage Inspection".

10.2 During wrap installation, verify the following attributes:

10.2.1 Each section installed with the circumference wrap method has a longitudinal overlap joint. as specified in the above sections.

10.2.2 Each section installed with the four piece method has the necessary overlaps.

10.2.3 Butt joints are reasonably tight with gaps not exceeding 3/8".

10.2.4 Gaps greater than 1/8" and up to 3/8" are filled with caulk prior to installing the next layer.

10.2.5 Correct mat type, layer count and configuration for each item.

10.2.6 Support wrap has been applied in accordance with the installation instructions in the above sections.

10.2.7 Except on supports, exposed mat such as longitudinal joints, and perimeter joints has been covered with tape for each layer installed. On the final layer, terminations, edges of collars, cover strips and joints of support wrap also have been taped.

10.2.8 4" collars are installed around all final layer perimeter butt joints, at concrete/mat interfaces and cover strips have been installed over all other final layer butt joints.

10.2.9 For primary items (conduits ,cable trays, etc.) 1/2" x 0.020 stainless steel banding has been installed 12" on center (+1/2" -0")(minimum one band per piece) and within 1" of the edge of all collars and terminations to concrete (min. two bands required per collar or concrete termination.

10.2.10 Where banding is used in conjunction with anchor bolts, a 3/4" width band shall be used.

10.2.11 For supports 1/2" x 0.020 stainless steel banding has been installed 12" on center (+1/2" -0")(minimum one band per piece)and within 2" of butt joints and terminations, also criss-cross straps at support/primary item intersections and as necessary to secure mat .

10.3 Upon completion of all wrap installation and prior to the pouring of penetration seals, perform a final visual inspection of the system. Verify that wrap is securely installed and all bands are tight. Verify that there is no exposed mat. Where mat is exposed it shall be covered with T-49 tape.

11.0 TEST PERFORMANCE

11.1 Fire Endurance Test

11.1.1 Each prepared test assembly shall be exposed to a three hour fire endurance test in a horizontal furnace based upon the standard ASTM E 119 time-temperature curve. Temperatures shall be measured and recorded at one minute intervals.

11.1.2 Upon completion of the three hour duration, the test assembly shall be immediately exposed to a hose stream test by randomly spraying all exposed surfaces utilizing a 1½" fog nozzle set at a discharge angle of 30° with a nozzle pressure of 75 psi and a minimum discharge of 75 gpm. The distance between the nozzle and specimen shall be a maximum of five feet and the total duration five minutes.

11.2 Acceptance Criteria

The testing organization shall assess the performance of the test assembly based upon the following pass criteria:

11.2.1 The average temperature rise recorded for each thermocouple group shall not exceed 250°F above the initial temperature.

11.2.2 The temperature rise recorded for any individual thermocouple shall not exceed the 250°F limit by more than 30%.

11.2.3 The wrap system remained intact during the fire exposure and hose stream tests without developing any openings through which the protected component, or raceway, is visible.

11.3 In the event that any of the above criteria are exceeded, further evaluation may be required to determine the acceptability of the wrap designs.(e.g., air

oven tests) If necessary, such additional evaluations will be determined and specified at the conclusion of the fire/hose stream test.

11.4 Final Report

11.4.1 Results shall be documented in a Final Test Report. This Final Report shall contain:

a) Applicable Corporate Test Procedure

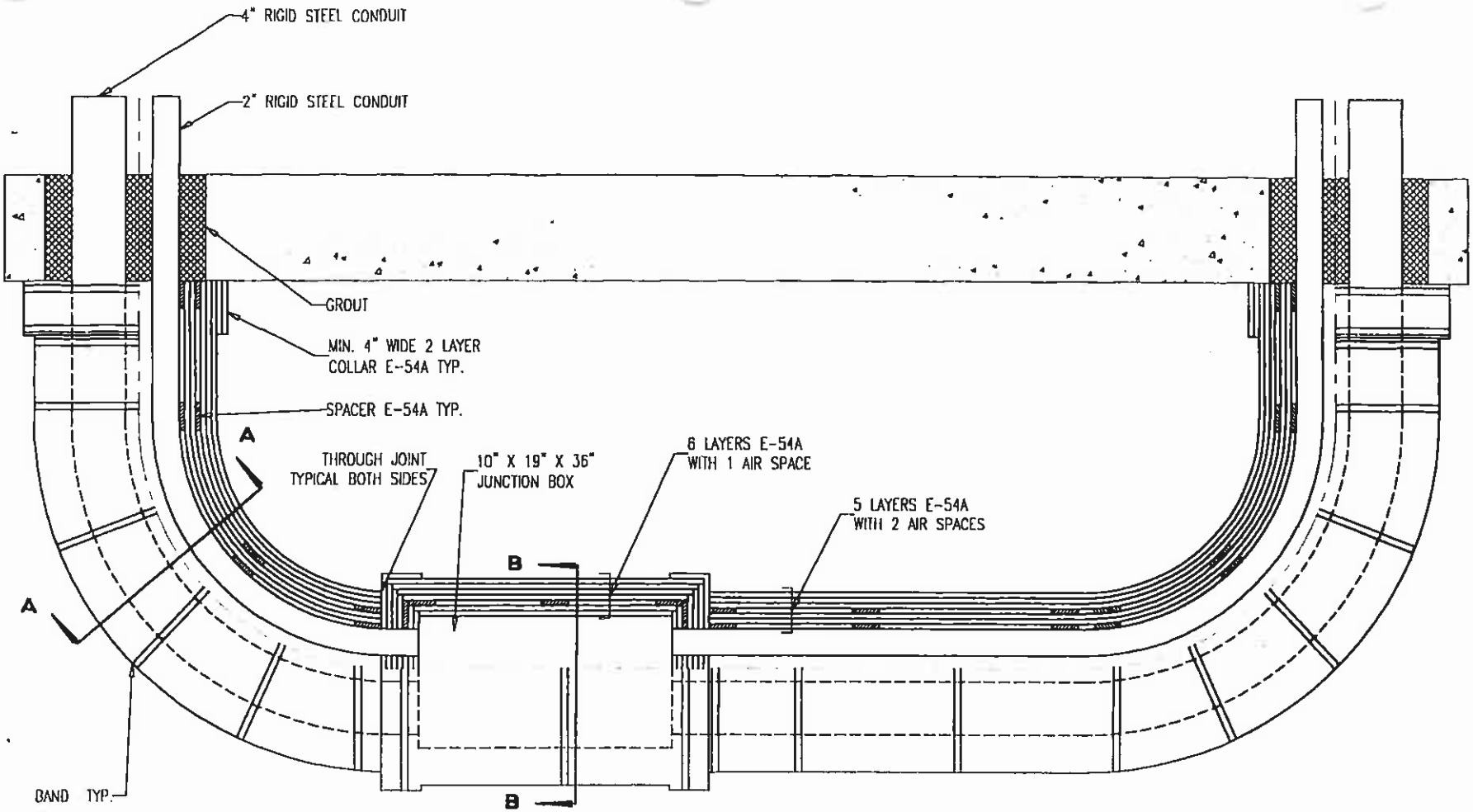
b) Quality Control documentation, as applicable

c) Summation of Test Results

d) Test report as supplied by Third Party Testing organization.

12.0 ATTACHMENTS

12.1 Peak Seals drawing PSI-2009.



NOTES:
1. ALL DIMENSIONS ARE ±1"
2. COLLARS ARE REQUIRED OVER ALL OUTER LAYER BUTT JOINTS PER CTP2009

PEAK SEALS, INC.
15926 Cypress N. Houston
Suite 100
Cypress, Texas 77429
(713) 256-2901

PEAK SEALS INCORPORATED

TITLE: MULTIPLE RIGID STEEL CONDUIT BANK FIRE TEST DETAIL 3M INTERAM 3 HOUR FIRE WRAP

Drawn By	Date	Sheet 1
MDM	1/12/98	File Name: OPL2009

Rev. No.	Date	App. By
0	1/12/98	DS
1	3/19/98	DS

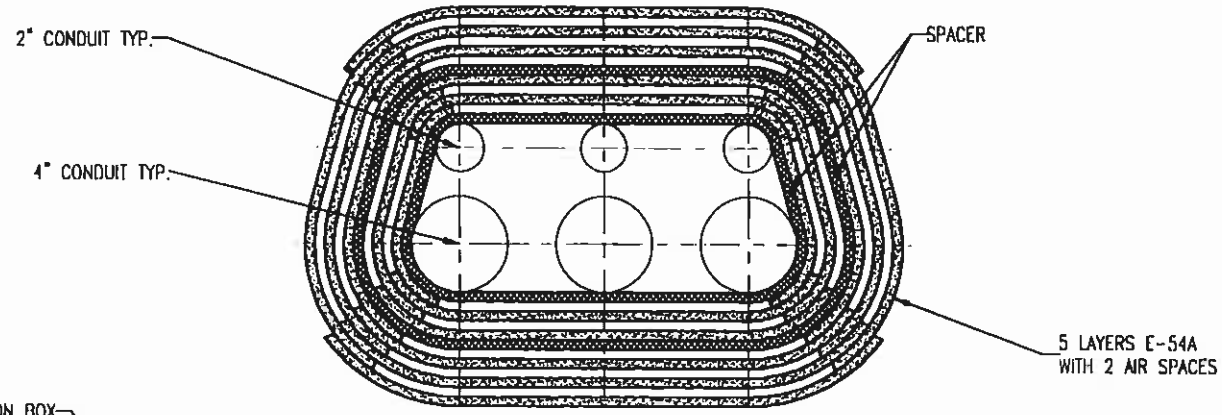
Davis-Besse Power Plant

Spec. No. E-286-AQ

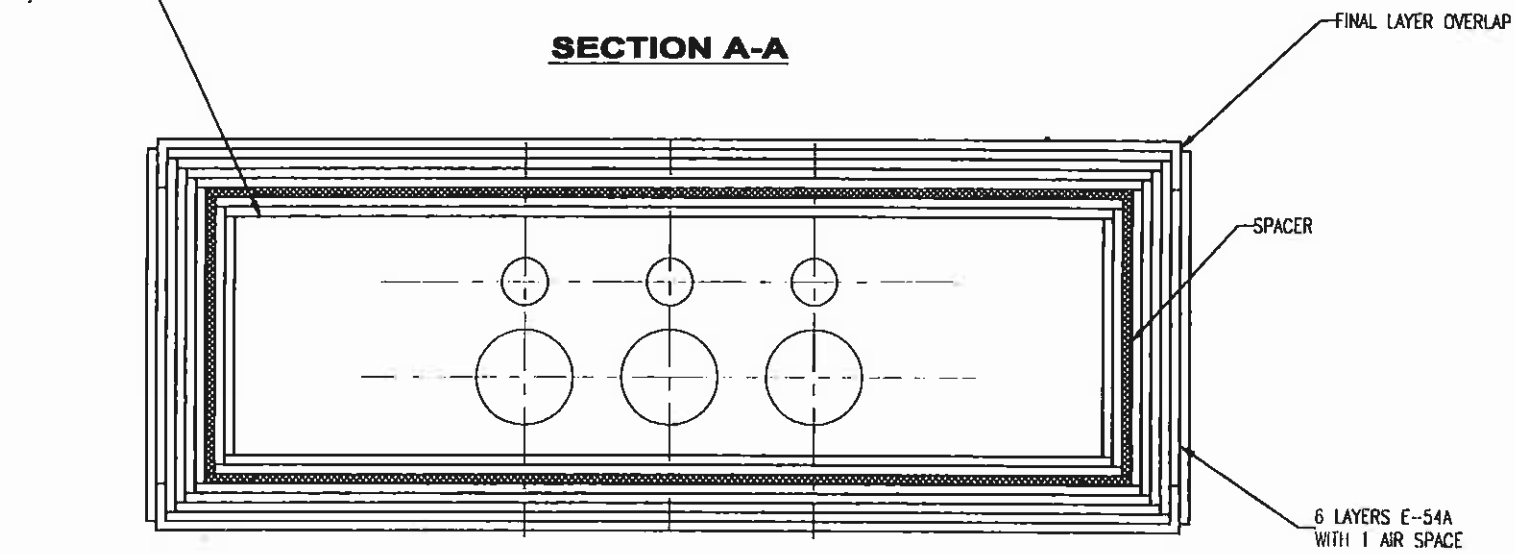
P.O. No.

Dwg No.: PSI-2009

A1



SECTION A-A



SECTION B-B

NOTE: ALL DIMENSIONS ARE ± 1"

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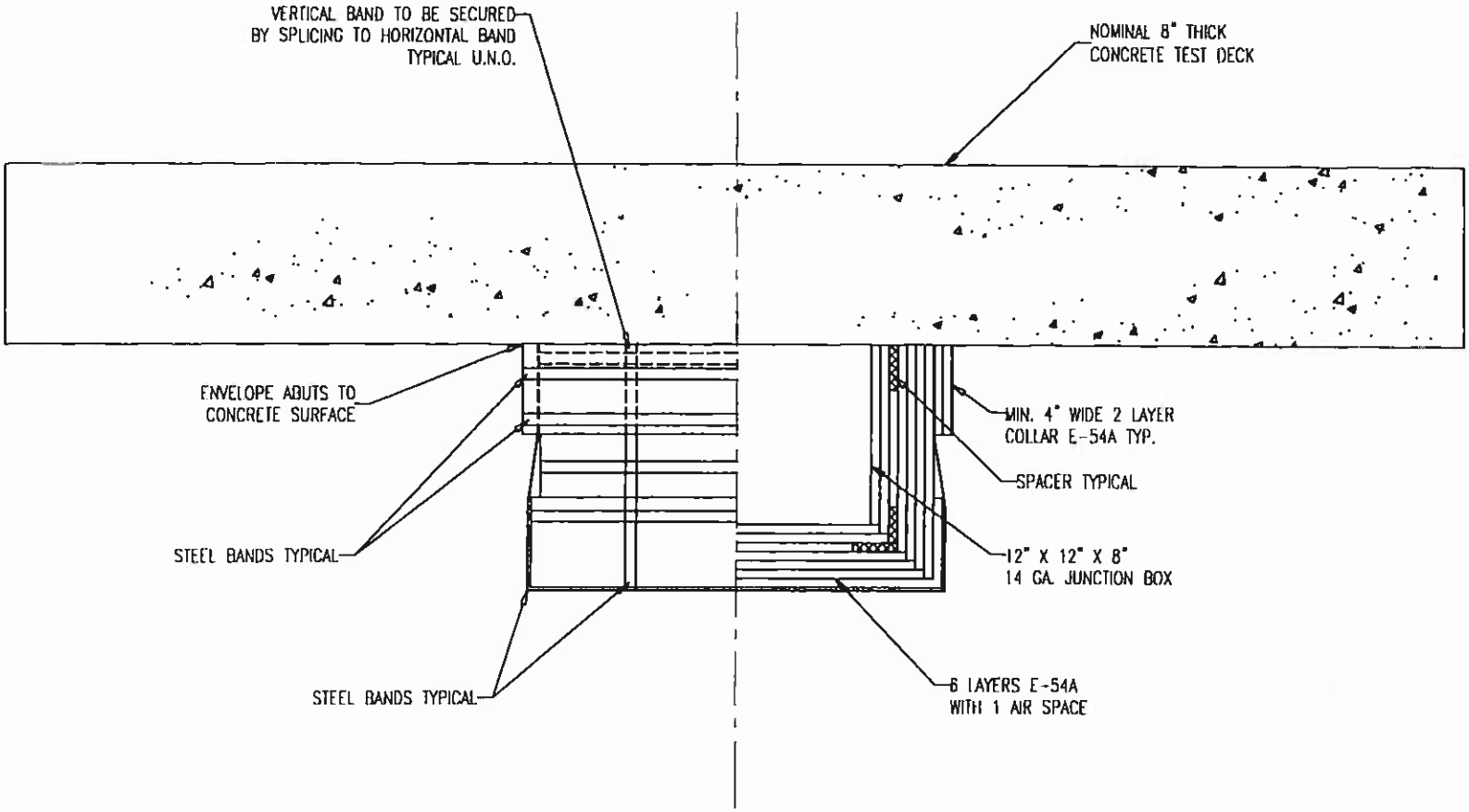
TITLE: MULTIPLE RIGID STEEL CONDUIT BANK FIRE TEST DETAIL 3M INTERAM 3 HOUR FIRE WRAP				Rev. No.	Date	App. By	Davis-Besse Power Plant
				0	1/12/98	DS	Spec. No. E-286-AQ
Drawn By	Date	Sheet 2		1	6/12/98	DS	P.O. No.
MDM	1/12/98	File Name: OPL2009					Dwg No.: PSI-2009



NOTE: ALL DIMENSIONS ARE ± 1"

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Cypress, Texas 77429
(713) 256-2901

PEAK SEALS INCORPORATED

TITLE: **MULTIPLE RIGID STEEL CONDUIT BANK FIRE TEST DETAIL 3M INTERAM 3 HOUR FIRE WRAP**

Drawn By	Date	Sheet 3
MDM	1/12/98	File Name: OPL2009

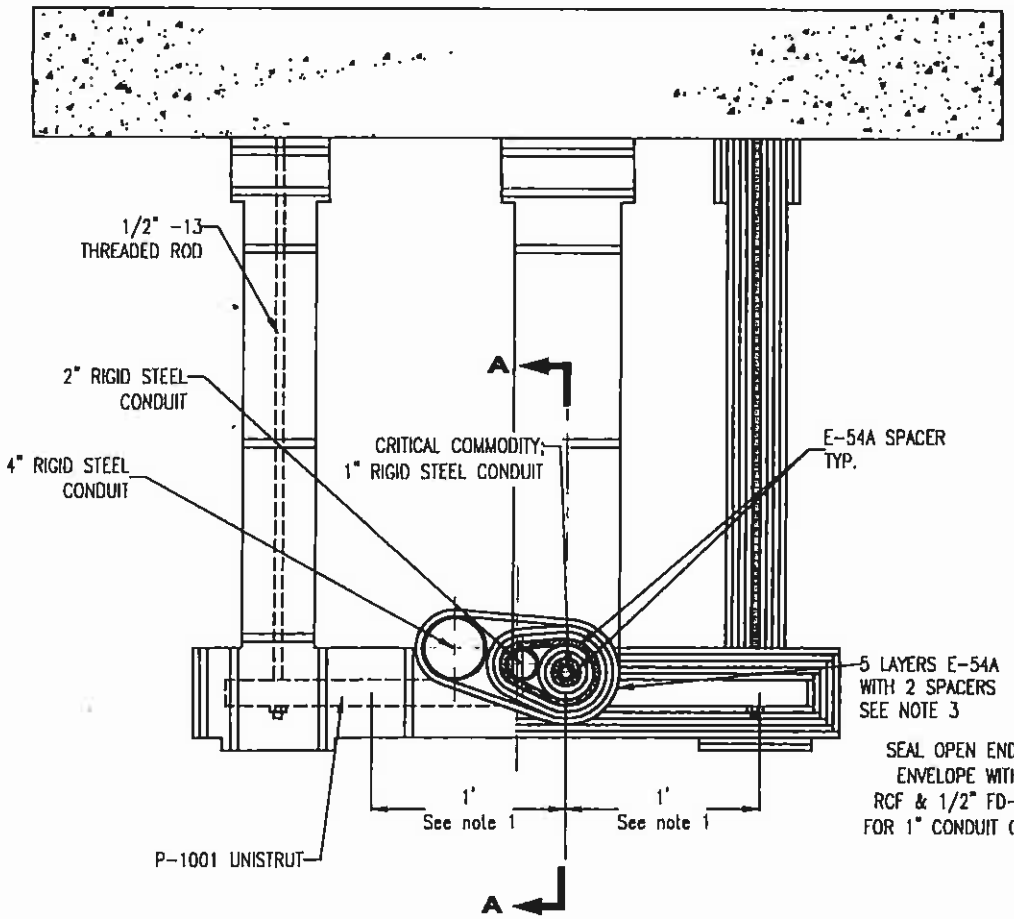
Rev. No.	Date	App. By
0	1/12/98	DS
1	2/12/98	DS

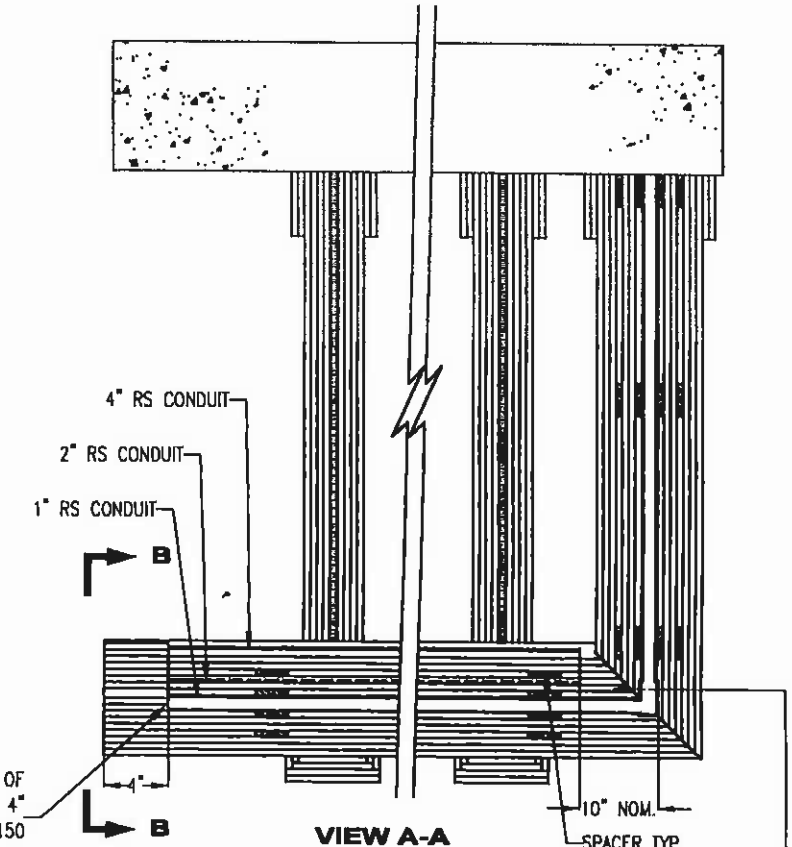
Davis-Besse Power Plant

Spec. No. E-286-AQ

P.O. No.

Dwg No.: PSI-2009





Notes:

1. The support within 12" min. of the critical commodity requires 5 layers E-54A. The remainder of the support length requires 4 layers E 54A.
2. All dimensions unless otherwise noted are ±1"
3. Apply as many of the required layers as possible to the critical commodity before encapsulating adjacent conduits.

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PEAK SEALS INCORPORATED

TITLE: **MULTIPLE RIGID STEEL CONDUIT BANK FIRE TEST DETAIL 3M INTERAM 3 HOUR FIRE WRAP**

Drawn By	Date	Sheet 4
MDM	1/12/98	File Name: OPL2009

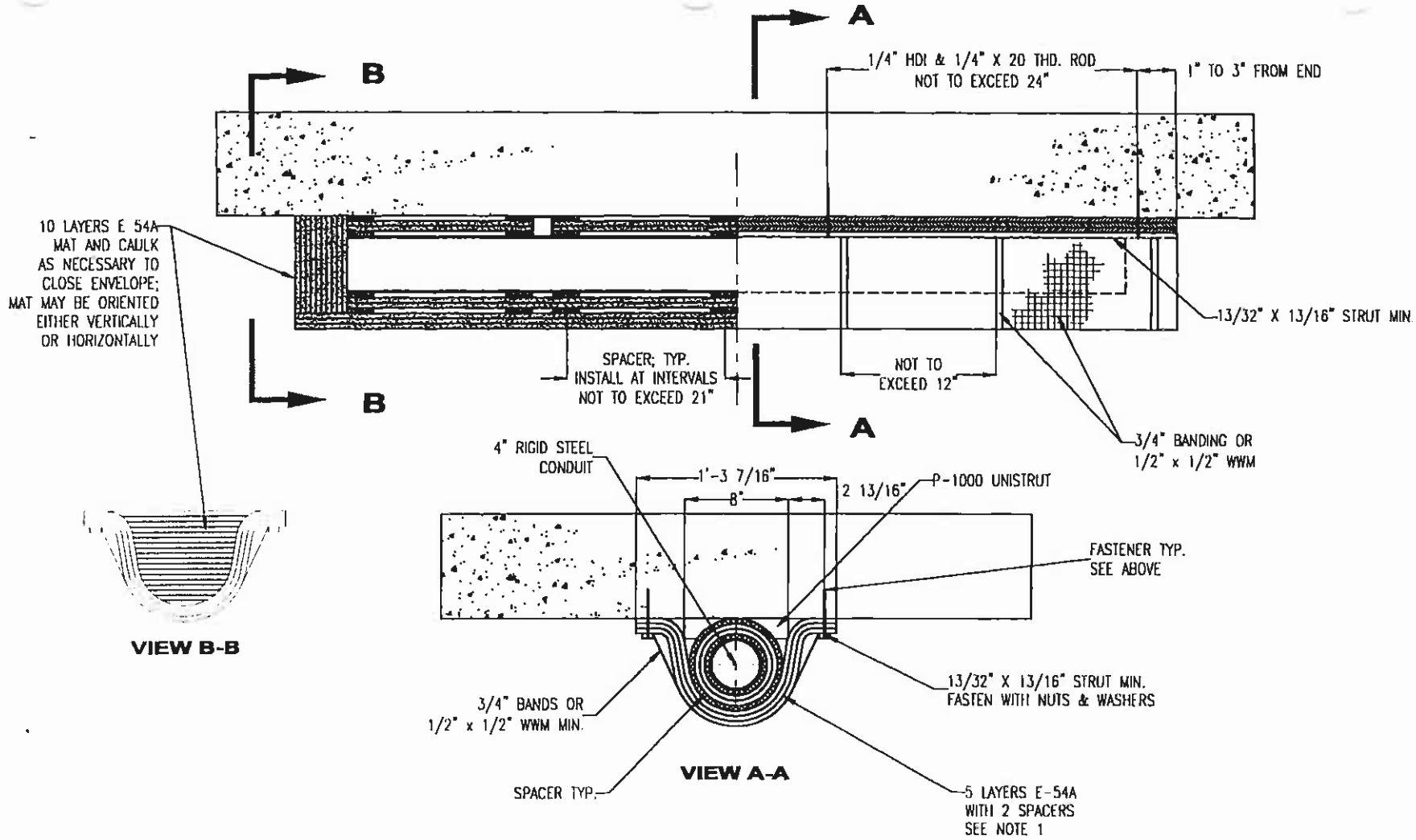
Rev. No.	Date	App. By
0	1/12/98	DS
1	3/24/98	DS
2	6/12/98	DS

Davis-Besse Power Plant

Spec. No. E-286-AQ

P.O. No.

Dwg No.: PSI-2009



Notes:

1. Apply as many of the required layers as possible to the critical commodity before flaring material and fastening to concrete deck.
2. All dimensions unless otherwise noted are ±1"
3. Through joint occurred in outer three layers in two places. Joints abutted lightly; no caulk used.

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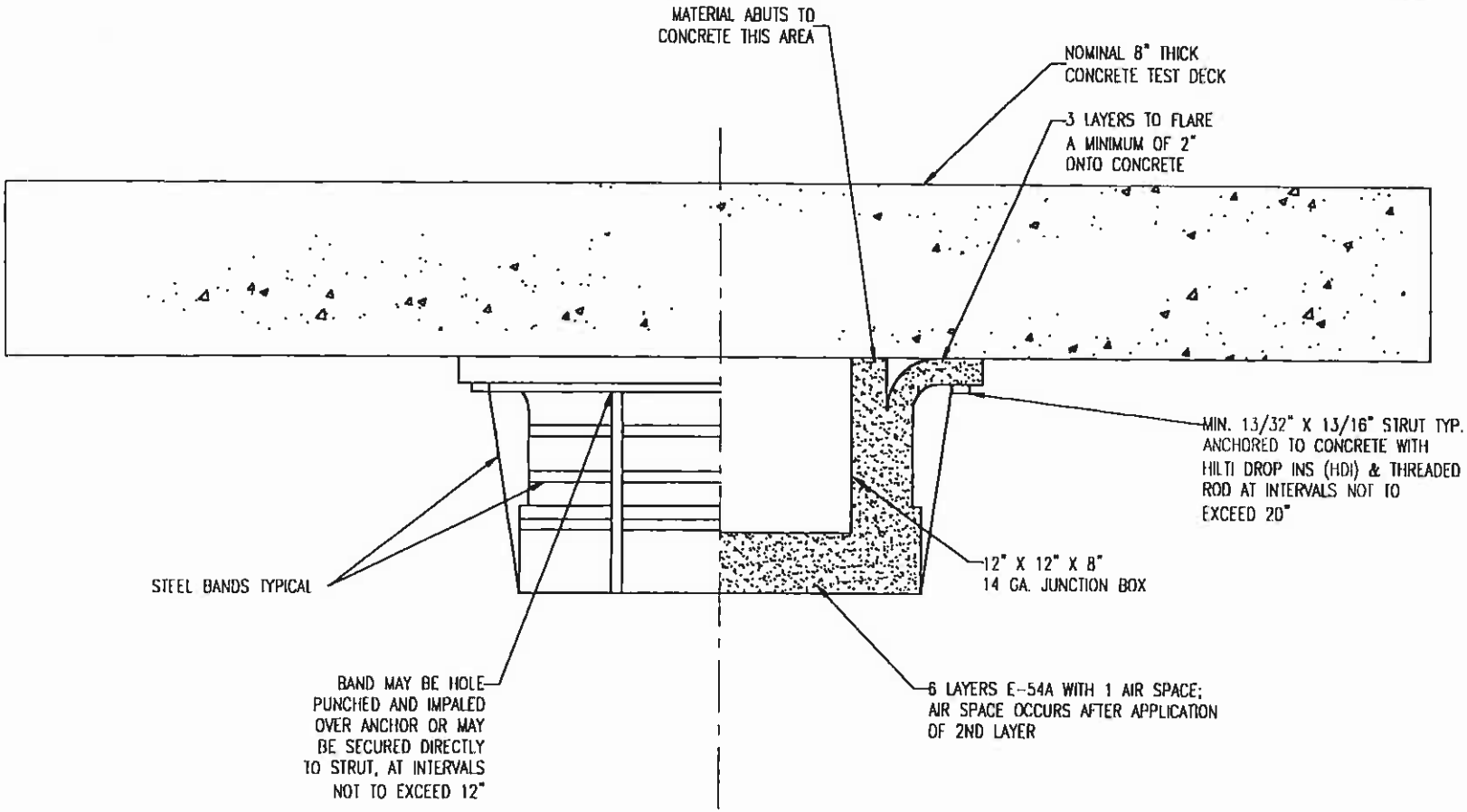
Cypress, Texas 77429
(713) 256-2901

TITLE: CONDUIT AGAINST CONCRETE FIRE TEST DETAIL 3M INTERAM 3 HOUR FIRE WRAP				Rev. No.	Date	App. By	Davis-Besse Power Plant
				1	1/26/98	DS	Spec. No. E-286-AQ
Drawn By	Date	Sheet 5		2	2/12/98	DS	P.O. No.
MDM	1/12/98	File Name: OPL2009		3	3/24/98	DS	Dwg No.: PSI-2009



NOTE: ALL DIMENSIONS ARE ± 1"

Peak Seals, Inc.
15926 Cypress N. Houston
Suite 100
Cypress, Texas 77429
(713) 256-2901

PEAK SEALS INCORPORATED

TITLE: **12" x 12" x 8" JUNCTION BOX FIRE TEST DETAIL 3M INTERAM 3 HOUR FIRE WRAP**

Drawn By	Date	Sheel 6
MDM	2/24/98	File Name: DPL2009

Rev. No.	Date	App. By
0	2/24/98	DS
1	3/6/98	DS
2	3/24/98	DS

Davis-Besse Power Plant

Spec. No. E-286-AQ

P.O. No.

Dwg No.: PSI-2009

U.S.NRC Supplement 1 to Letter 86-10

OMEGA POINT LABORATORIES

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

March 25, 1994

TO: ALL HOLDERS OF OPERATING LICENSES OR CONSTRUCTION PERMITS FOR NUCLEAR POWER REACTORS

SUBJECT: FIRE ENDURANCE TEST ACCEPTANCE CRITERIA FOR FIRE BARRIER SYSTEMS USED TO SEPARATE REDUNDANT SAFE SHUTDOWN TRAINS WITHIN THE SAME FIRE AREA (SUPPLEMENT 1 TO GENERIC LETTER 86-10, "IMPLEMENTATION OF FIRE PROTECTION REQUIREMENTS")

PURPOSE

The U.S. Nuclear Regulatory Commission (NRC) is issuing Supplement 1 to Generic Letter (GL) 86-10, "Implementation of Fire Protection Requirements," April 24, 1986, to disseminate the review guidance contained in Enclosure 1, "Fire Endurance Test Acceptance Criteria for Fire Barriers Used to Separate Redundant Safe Shutdown Trains Within the Same Fire Area." This guidance will be used by the staff to review and evaluate the adequacy of fire endurance tests and fire barrier systems proposed by licensees or applicants in the future to satisfy existing NRC fire protection rules and regulations. This guidance refines and clarifies the fire barrier testing acceptance criteria specified by GL 86-10, for application in that specific (future review) context.

BACKGROUND

On April 24, 1986, the NRC issued GL 86-10 in order to give the industry additional guidance on implementing NRC fire protection requirements. The guidance in GL 86-10 did not change the requirement to separate one safe shutdown train from its redundant train with either a 1-hour or a 3-hour fire rated barrier. In Enclosure 2 to GL 86-10, the NRC staff responded to industry questions. Question 3.2.1 of the enclosure provided the staff position on fire endurance test acceptance criteria for fire barrier cable tray wraps. In its response, the staff stated that Chapter 7, "Tests of Nonbearing Walls and Partitions," of National Fire Protection Association (NFPA) Standard 251, "Standard Methods of Fire Tests of Building Construction," was applicable to cable-tray fire wraps.

On July 30, 1991, the NRC established a special review team to identify and evaluate technical issues related to the Thermo-Lag 330-1 fire barrier system. On August 6, 1991, the NRC issued Information Notice (IN) 91-47, "Failure of Thermo-Lag Fire Barrier Material to Pass Fire Endurance Test." This IN gave licensees information on the fire endurance test performed by Gulf States Utilities Company on a Thermo-Lag 330-1 fire barrier installed on a wide aluminum cable tray and the associated fire test failure. On December 6, 1991, the NRC issued IN 91-79, "Deficiencies in the Procedures for Installing Thermo-Lag Fire Barrier Material," which gave information on deficiencies in procedures that the Thermo-Lag vendor (Thermal Science, Incorporated) provided for constructing Thermo-Lag 330-1 fire barriers. In

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response to concerns about the indeterminate qualifications of Thermo-Lag 330-1 fire barriers, on June 23, 1992, the NRC issued IN 92-46, "Thermo-Lag Fire Barrier Material Special Review Team Findings, Current Fire Endurance Tests, and Ampacity Calculation Errors." The staff found the following problems with Thermo-Lag 330-1 fire barriers: incomplete or indeterminate fire test results, questionable ampacity derating test results and a wide range of documented ampacity derating factors, some barrier installations that were not constructed in accordance with vendor-recommended installation procedures, incomplete installation procedures, and as-built fire barrier configurations that may not have been qualified by valid fire endurance tests or evaluated in accordance with the guidance of GL 86-10.

After reviewing INs 91-47 and 91-79, Texas Utilities (TU) Electric Company initiated a fire endurance test program to qualify the Thermo-Lag raceway fire barrier systems for Comanche Peak Steam Electric Station. Under this program, TU Electric performed an initial fire barrier test series during the weeks of June 15 and 22, and August 19, 1992. Notwithstanding the fire test acceptance criteria guidance specified in GL 86-10, TU Electric followed the guidance of American Nuclear Insurers (ANI) as specified in ANI Information Bulletin 5(79), "ANI/MAERP Standard Fire Endurance Test Method to Qualify a Protective Envelope for Class 1E Electrical Circuits," July 1979.

As a result of NRC interaction with TU Electric regarding its test program, the NRC concluded that there was uncertainty on the part of licensees as to whether or not the ANI test method established a level of fire barrier performance equivalent to that established by the GL 86-10 acceptance criteria. In addition, the NRC staff recognized that the 1-hour and 3-hour raceway fire barrier systems are unique and that additional guidance on the proper implementation of the GL 86-10 acceptance criteria would be useful.

AREAS OF CONCERN

The experiences with Thermo-Lag fire barrier systems at TU Electric recounted above raised the following general concerns:

(1) The fire endurance test acceptance criteria used by other fire barrier vendors, applicants, and licensees may not meet the acceptance criteria of GL 86-10, and may not fully demonstrate the fire barrier performance intended.

(2) Certain past cable functionality testing (i.e., circuit integrity monitoring) may not fully demonstrate the capability of protected circuits to function during and after a postulated fire.

FIRE ENDURANCE CAPABILITY

NRC Qualification Requirements and Guidance for Fire Barriers

Section 50.48 of 10 CFR requires that each operating nuclear power plant have a fire protection plan that satisfies General Design Criterion (GDC) 3. GDC 3 requires that structures, systems, and components important to safety be

designed and located to minimize, in a manner consistent with other safety requirements, the probability and effects of fires. Fire protection features required to satisfy GDC 3 include features to ensure that one train of those systems necessary to achieve and maintain shutdown conditions be maintained free of fire damage. One means of complying with this requirement is to separate one safe shutdown train from its redundant train with a fire-rated barrier. The level of fire resistance required of the barrier, 1-hour or 3-hours, depends on the other fire protection features in the fire area.

The NRC issued guidance on acceptable methods of satisfying the regulatory requirements of GDC 3 in Branch Technical Position (BTP) Auxiliary and Power Conversion Systems Branch (APCSB) 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants;" Appendix A to BTP APCSB 9.5-1; BTP Chemical Engineering Branch (CMEB) 9.5-1, "Fire Protection for Nuclear Power Plants;" and GL 86-10. In the BTPs and in GL 86-10, the staff stated that the fire resistance ratings of fire barriers should be established in accordance with NFPA Standard 251, "Standard Methods of Fire Tests of Building Construction and Materials," by subjecting a test specimen that represents the materials, workmanship, method of assembly, dimensions, and configuration for which a fire rating is desired to a "standard fire exposure.[1]"

Some licensees have used the acceptance criteria of ANI Bulletin No. 5(79), to evaluate the performance of their fire barrier systems. The ANI test methodology, which ANI issued for insurance purposes only, requires that cables within the fire barrier test specimen be monitored for circuit integrity while the test specimen is subjected to a test fire that follows the standard time-temperature curve specified in American Society of Testing and Materials (ASTM) Standard E-119, "Standard Methods of Fire Tests of Building Construction and Materials," and to a hose stream test. Under this criterion, the fire barrier system is evaluated by monitoring the capability of the cables inside the fire barrier to pass a low voltage circuit integrity test. During the fire and hose stream tests, if cable circuit integrity is maintained, the tests are considered successful. The ANI test methodology does not specify the following GL 86-10 acceptance criteria:

(1) The fire barrier design has withstood the fire endurance test without the passage of flame or the ignition of cotton waste on the unexposed side for a period of time equivalent to the fire-resistance rating required of the barrier.

(2) Analysis of temperature levels recorded on the unexposed side of the fire barrier demonstrates that the maximum temperature rise does not exceed 139 °C [250 °F] above ambient temperature.[2]

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[1] American Society for Testing and Materials Standard E-119 was adopted by NFPA as NFPA Standard 251.

[2] The 163 °C [325 °F] temperature condition was established by allowing the temperature of the unexposed side of the fire barrier to rise 139 °C [250 °F] above the assumed 24°C [75°F] ambient air temperature, as measured by the

(3) The fire barrier remains intact and does not allow water to be projected beyond the unexposed surface during the hose stream test.

Enclosure 1, "Interpretations of Appendix R," to GL 86-10, provided additional guidance with respect to the term "free of fire damage" as used in Appendix R. Interpretation 3, "Fire Damage," stated: "In promulgating Appendix R, the Commission has provided methods acceptable for assuring that necessary structures, systems, and components are free from fire damage (see Section III.G.2a, b, and c), that is, the structure, system or component under consideration is capable of performing its intended function during and after the postulated fire, as needed."

The review guidance provided in Enclosure 1 (1) clarifies the applicability of the test acceptance criteria stated in GL 86-10 to raceway fire barrier systems, (2) specifies a set of fire endurance test acceptance criteria which are acceptable for demonstrating that fire barrier systems can perform the required fire-resistive function and maintain the protected safe shutdown train free of fire damage, (3) specifies acceptable options for hose stream testing, and (4) specifies acceptable criteria for functionality testing of cables when a deviation is necessary, such as when the fire barrier temperature rise criteria are exceeded or the test specimen cables sustain visible damage.

The test methods and acceptance criteria specified in Enclosure 1 are acceptable for determining the adequacy of fire barrier systems proposed by licensees or applicants in the future to satisfy NRC fire protection rules and regulations. Applicants or licensees may propose alternative test methods and acceptance criteria to demonstrate an equivalent level of protection; the staff will review such proposals on a case-by-case basis. Enclosure 2 is a summary comparison of this review guidance against the GL 86-10 acceptance criteria.

Evaluation and Application of Fire Endurance and Functionality Test Results

The fire endurance qualification test is successful for a raceway fire barrier if the following conditions are satisfied (see Enclosure 3, "Fire Barrier Testing Acceptance Criteria/Logic Diagram"):

(1) The average internal temperature of the fire barrier system, as measured on the exterior surface of the raceway or component, did not rise more than 139 °C [250 °F] above its initial temperature; and

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thermocouples within the test specimen at the onset of the fire exposure, during the fire test.

(2) When cables or components are included in the test specimen, a visual inspection of the protected cables or components revealed no signs of degraded conditions[3] from the thermal effects[4] of the fire exposure; and

(3) The fire barrier system remained intact during the fire exposure and hose stream tests without developing any openings through which the protected component, raceway, or cables are visible.

For raceway fire barrier systems, the staff adopted the hose stream testing methodology specified in NUREG-0800, "Standard Review Plan (SRP) for the Review of Safety Analysis Reports for Nuclear Power Plants," Section 9.5.1, "Guidelines for Fire Protection for Nuclear Power Plants," Revision 2, July 1981, Position 5.a. This SRP position established the acceptability of using the fog nozzle method for hose stream testing of fire barrier penetration seals. The fog nozzle hose stream test method is an acceptable option for tests of the entire raceway fire barrier system under the new staff position.

Licensees that propose to use fire endurance test results that deviate from the acceptance criteria as the bases for qualifying and installing fire barrier configurations, should request a deviation from the acceptance criteria based on a engineering evaluation acceptable to the staff, such as demonstrating cable functionality. For those licensees required to comply with Section III.G to Appendix R, the engineering evaluation justifying the deviating conditions should be submitted with the exemption request. The review guidance provided in Enclosure 1 provides specific guidance for demonstrating cable functionality, including subjecting the cables to Megger and high-potential tests. The results of these tests can be used to determine the insulation-resistance characteristics of the thermally damaged cable and to determine if the cable insulation would have been sufficient to maintain circuit functionality during and after the fire exposure.

IMPLEMENTATION

This section describes how the NRC plans to use the review guidance contained in Enclosure 1. After this supplement to GL 86-10 is issued, except in those cases in which an applicant or licensee has proposed an acceptable alternative fire endurance test method and acceptance criteria that demonstrates an equivalent level of fire protection, the NRC will use the methods and the

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[3] Examples of thermal degradation of cable jacket and insulation materials are: swollen, split, cracked, blistered, melted, or discolored jacket; exposed shield; exposed, degraded, or discolored conductor insulation; and exposed copper conductor.

[4] When the temperature criterion is exceeded or damage occurs, operability at the temperature conditions experienced during the fire test must be assessed. That is, fire endurance tests that are judged acceptable on the basis of a visual inspection of certain components or cables may not be applied to other components or cables without a specific evaluation.

criteria specified in the enclosed review guidance to (1) evaluate fire endurance testing programs proposed by licensees or applicants in the future or demonstrating compliance with pertinent NRC fire protection rules and regulations and (2) review the adequacy of the fire barrier systems proposed in the future by applicants or licensees.

ACTIONS REQUESTED

None.

REPORTING REQUIREMENTS

None.

BACKFIT DISCUSSION

The guidance transmitted by this generic letter supplement will be used by the staff for review and evaluation of the adequacy of fire barrier systems and fire endurance tests that may be proposed in the future to satisfy NRC fire protection rules and regulations. This guidance refines and clarifies the guidance specified in Generic Letter 86-10 for application in that future review context; specifically it (1) clarifies the applicability of the test acceptance criteria stated in GL 86-10 to raceway fire barrier systems, (2) specifies a set of fire endurance test acceptance criteria which are acceptable for demonstrating that fire barrier systems can serve the required fire-resistive function and maintain the protected safe shutdown train free of fire damage, (3) contains acceptable options for hose stream testing, and (4) specifies acceptable criteria for functionality testing of cables when a deviation would be necessary, such as if the fire barrier temperature rise criteria are exceeded or the cable sustains visible damage.

No generic or plant-specific backfitting is intended or approved at this time in connection with issuance of this review guidance. The staff may consider the need for further generic action in that regard, if the industry guidance currently under development for addressing the pertinent fire protection issues is substantively inconsistent with this staff review guidance; but such action would be separately justified in accordance with the criteria of 10 CFR 50.109 and existing NRC backfit procedures. Similarly, if plant-specific backfits are proposed by the NRC staff consistent with this review guidance, the proposed backfits would be justified on a case-by-case basis in accordance with the criteria of 10 CFR 50.109 and existing NRC backfit procedures.

If you have any questions about this matter, please contact one of the contacts listed below or the appropriate Office of Nuclear Reactor Regulation project manager.

Sincerely,

Luis A. Reyes
Acting Associate Director for Projects
Office of Nuclear Reactor Regulation

Enclosures:
1. NRC Staff Review Guidance and Fire Endurance Test Acceptance Criteria for Fire Barrier Systems Used To Separate Redundant Safe Shutdown Trains Within the Same Fire Area.
2. Comparison of Staff Position on Fire Endurance Test Acceptance Criteria for Fire Barrier Systems Used To Separate Redundant Safe Shutdown Trains Within the Same Fire Area to the Acceptance Criteria of GL 86-10.
3. NRC Fire Testing Acceptance Criteria Logic Diagram.
4. List of Recently Issued Generic Letters

Technical contact: Patrick M. Madden, NRR
(301) 504-2854

Lead Project Manager: Marsha K. Gamberoni, NRR
(301) 504-3024

FIRE ENDURANCE TEST ACCEPTANCE CRITERIA FOR FIRE BARRIER SYSTEMS USED TO SEPARATE REDUNDANT SAFE SHUTDOWN TRAINS WITHIN THE SAME FIRE AREA

I. BACKGROUND

In 1975, the Browns Ferry Nuclear power plant experienced a serious electrical cable tray fire. This fire had a significant impact on operator response to the event from a safety perspective. The fire caused spurious instrumentation indications and affected the control of several safety systems. As a result of this fire, the NRC issued the following fire protection guidelines and regulations concerning fire protection programs at nuclear power plants:

May 1, 1976	Branch Technical Position (APCSB) 9.5-1, "Fire Protection Program."
February 24, 1977	Appendix A to Branch Technical Position APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976."
February 19, 1981	10 CFR 50.48, "Fire Protection."
February 19, 1981	Appendix R to 10 CFR Part 50, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1979."
July 1981	NUREG-0800, Standard Review Plan (SRP), 9.5.1, "Fire Protection for Nuclear Power Plants."

In addition to the above fire protection guidance and regulations, the NRC, in an effort to clarify its fire protection requirements to the industry, issued Generic Letter (GL) 81-12, "Fire Protection Rule (45 FR 76602, November 19, 1980)," February 20, 1981; GL 83-33, "NRC Position on Certain Requirements of Appendix R to 10 CFR 50," October 19, 1983; and GL 86-10, "Implementation of Fire Protection Requirements," April 24, 1986. GL 86-10, which took precedence over previous staff guidance, provided staff interpretations to Appendix R and answers to industry questions regarding the implementation of Appendix R. The NRC, in an effort to give the licensees flexibility to make changes to its plant specific fire protection program, issued GL 88-12, "Removal of Fire Protection Requirements From Technical Specifications," August 2, 1988. Through the implementation and the adoption of a standard license condition, a licensee can make changes which do not adversely affect the ability to achieve and maintain post-fire safe shutdown to its fire protection program in accordance with 10 CFR 50.59.

The aforementioned NRC documents provided NRC staff guidance concerning fire barriers separating plant fire areas, including the fire resistance (endurance) ratings for the barriers and the qualification tests that establish their fire resistance ratings. In addition, the documents provided

guidance on combustibility of structural materials and tests for demonstrating low flame spread properties.

The following sections of this document provide the objective for providing safe shutdown related fire barriers in nuclear power plants, definition of fire protection terms related to fire barriers, and the NRC fire endurance test acceptance criteria for fire barriers used to separate safe shutdown functions within the same fire area.

II. OBJECTIVE OF FIRE BARRIERS USED TO SEPARATE SAFE SHUTDOWN FUNCTIONS WITHIN THE SAME FIRE AREA

Fire rated barriers are used in nuclear power plants to provide fire area separation between redundant safety-related components and safe shutdown functions. They provide fire resistance protection, as required by Appendix R[5], to one safe shutdown train in those fire areas which contain both trains. The objective of the safe shutdown related Appendix R fire barrier is to ensure that a safe shutdown train is conservatively protected from fire-related thermal damage. The necessity for these fire barriers has been verified by multiple probabilistic risk assessments (PRAs). These PRAs indicated that, even with fire barriers installed, fires are a major contributor to core melt probabilities.

It is the position of the NRC that fire endurance ratings of building construction and materials are demonstrated by testing fire barrier assemblies in accordance with the provisions of the applicable sections of NFPA 251, "Standard Methods of Fire Tests of Building Construction and Materials," and ASTM E-119, "Fire Test of Building Construction and Materials." Assemblies that pass specified acceptance criteria (e.g., standard time-temperature fire endurance exposure, unexposed side temperature rise, and hose stream impingement) are considered to have a specific fire resistance rating.

Enclosure 1 to GL 86-10, "Interpretations of Appendix R," provided additional guidance with respect to the term "free from fire damage." Interpretation 3, "Fire Damage," states, "In promulgating Appendix R, the Commission has provided methods acceptable for assuring that necessary structures, systems, and components are free from fire damage (see Section III.G.2a, b, and c), that is, the structure, system or component under consideration is capable of performing its intended function during and after the postulated fire, as needed."

GL 86-10, Response 3.2.1, also stated that, "The resulting 325 °F cold side temperature criterion is used for cable tray wraps because they perform a fire barrier function to preserve the cables free from fire damage. It is clear that cable that <u>begins to degrade</u> at 450 °F is free from fire damage at 325 °F." (Emphasis added.) In addition, the staff response stated that, "for newly identified conduit and cable trays requiring such wrapping new materials

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[5] For advanced reactor designs, redundant safe shutdown functions are required to be located in separate 3-hour fire areas.

which meet the 325 °F criterion should be used, or justification should be provided for the use of material which does not meet the 325 °F criterion. This may be based on an analysis demonstrating that the maximum recorded temperature is sufficiently below the cable insulation ignition temperature." (Emphasis added.)

The basic premise of the NRC fire resistance criteria is that fire barriers which do not exceed 163 °C [325 °F] cold side temperature[6] and pass the hose stream test provide adequate assurance that the shutdown capability is protected without further analyses. If the temperature criteria is exceeded, sufficient additional information is needed to perform an engineering evaluation to demonstrate that the shutdown capability is protected.

III. DEFINITIONS

In order to support the understanding of the technical terms used throughout this document, the following definitions are provided.

Combustible Material - Material that does not meet the definition of non-combustible.

Fire Barrier - Those components of construction (walls, floors and their supports), including beams, joists, columns, penetration seals or closures, fire doors, and fire dampers that are rated by approving laboratories in hours of resistance to fire and are used to prevent the spread of fire.

Fire Resistance Rating - The time that materials of a test assembly have withstood a standard ASTM E-119 fire exposure and have successfully met the established test acceptance criteria (fire barrier test acceptance criteria refer to Sections IV, V, and VI).

Noncombustible Material - (a) Material which, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat; (b) Material having a structural base of noncombustible material, with a surfacing not over 1/8-inch thick that has a flame spread rating of not higher than 50 when measured in accordance with ASTM E-84, "Surface Burning Characteristics of Building Materials." (There is an exception to this definition as defined by BTP Appendix A, Position D.1.d. This position allows the use of combustible interior finishes when listed by a nationally recognized test laboratory, such as Factory Mutual or Underwriters Laboratories, Incorporated, for a flame spread, smoke and fuel contribution of 25 or less in its use configuration.)

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[6] The 163 °C [325 °F] temperature condition was established by allowing the temperature of the unexposed side of the fire barrier to rise 139 °C [250 °F] above the assumed 24 °C [75 °F] ambient air temperature, as measured by the thermocouples within the test specimen at the onset of the fire exposure during the fire test.

Raceway - Cable trays, conduits, junction boxes, and other components used to support and route cables from circuit termination to circuit termination.

Raceway Fire Barrier - Nonload bearing partition type envelope system installed around electrical components and cabling that are rated by test laboratories in hours of fire resistance and are used to maintain safe shutdown functions free of fire damage.

IV. FIRE ENDURANCE TEST ACCEPTANCE CRITERIA FOR FIRE BARRIER WALLS, FLOORS, CEILINGS, AND FREE STANDING EQUIPMENT ENCLOSURES USED TO SEPARATE SAFE SHUTDOWN FUNCTIONS WITHIN THE SAME FIRE AREA

To demonstrate the adequacy of fire barrier walls, floors, ceilings, and enclosures, barrier designs should be verified by fire endurance testing. NRC fire protection guidance refers to the guidance of NFPA 251 and ASTM E-119 as acceptable test methods for demonstrating fire endurance performance.

The fire endurance test acceptance criteria for the subject fire barriers are:

The fire barrier design has withstood the fire endurance test without the passage of flame or the ignition of cotton waste on the unexposed side for a period of time equivalent to the fire resistance rating required of the barrier;

The temperature levels recorded on the unexposed side of the fire barrier are analyzed and demonstrable that the maximum temperature does not exceed 139 °C [250 °F] above ambient; and

The fire barrier remains intact and does not allow projection of water beyond the unexposed surface during the hose stream test. (For acceptable hose stream test methods and time of application - See Section VII.)

If the above criteria are met for fire barrier walls, floors, ceilings, and free standing equipment enclosures separating safe shutdown functions within the same fire area, the barrier is acceptable.

NRC fire protection guidance also ensures that door and ventilation openings and penetrations are properly protected. The guidance requires that these openings be protected with fire doors and fire dampers which have been fire tested and listed by a nationally recognized test laboratory (e.g., Factory Mutual or Underwriters Laboratories, Incorporated). In addition, the construction and installation techniques for door and ventilation openings and other penetrations through these fire barriers should be qualified by fire endurance tests.

The guidance of NFPA 251 and ASTM E-119 should be consulted with regard to construction, materials, workmanship, and details such as dimensions of parts, and the size of the specimen(s) to be tested. In addition, NFPA 251 and ASTM E-119 should be consulted with regard to the placement of thermocouples on the specimen.

V. FIRE ENDURANCE TEST ACCEPTANCE CRITERIA FOR ELECTRICAL RACEWAY AND COMPONENT FIRE BARRIER SYSTEMS FOR SEPARATING SAFE SHUTDOWN FUNCTIONS WITHIN THE SAME FIRE AREA

The NRC provided guidance in Appendix A to Branch Technical Position 9.5-1, Position D.3.(d), for cable tray fire barriers. This fire protection guidance states that the design of fire barriers for horizontal and vertical cable trays should, as a minimum, meet the requirements of ASTM E-119, "Fire Test of Building Construction and Materials," including hose stream test. On November 19, 1980, the NRC issued Appendix R to 10 CFR Part 50. The technical basis for Section III.M, "Fire Barrier Penetration Seal Qualification," states that "Fire barriers are 'rated' for fire resistance by being exposed to a 'standard test fire.' This standard test fire is defined by the American Society of Testing and Materials in ASTM E-119." In addition, this technical basis stated that "[i]f specific plant conditions preclude the installation of a 3-hour fire barrier to separate the redundant trains, a 1-hour fire barrier and automatic fire suppression and detection system for each redundant train will be considered the equivalent of a 3-hour barrier." Appendix R to 10 CFR Part 50, Section III.G, "Fire protection of safe shutdown capability," provides what the NRC views as equivalent means for ensuring that one safe shutdown train remains free of fire damage.

In 1984 Appendix R workshops held with industry, and later in GL 86-10, the staff provided guidance related to fire barrier designs for raceways. In Enclosure 2, "Question and Answers," to this GL, Question 3.2.1., "Acceptance Criteria," the staff provided guidance on the cold side temperature for fire barrier cable tray wraps. In response to this question the staff stated that the acceptance criteria contained in Chapter 7 of NFPA 251, "Standard Methods of Fire Tests of Building Construction and Materials," pertaining to non-bearing fire barriers was applicable to cable tray fire barrier wraps. Chapter 5 of NFPA 251 explains the conduct of the fire test.

The following is the NFPA 251 acceptance criteria:

- The wall or partition withstood the fire endurance test without the passage of flame or gases hot enough to ignite cotton waste, for a period equal to that for which classification is desired;

- The wall or partition withstood the fire and hose stream tests specified in Chapter 5, without the passage of flame, gases hot enough to ignite cotton waste, or the hose stream. The assembly failed the hose stream test if an opening develops that permits the projection of water from the stream beyond the unexposed surface during the hose stream test; and

- Transmission of heat through the wall or partition during the fire endurance test did not raise the temperature on the unexposed surfaces more than 139 °C [250 °F] above their initial temperatures.

The staff considers the fire endurance qualification test for fire barrier materials applied directly to a raceway or component to be successful if the following conditions are met:

- The average unexposed side temperature of the fire barrier system, as measured on the exterior surface of the raceway or component, did not exceed 139 °C [250 °F] above its initial temperature; and

  (Staff Guidance: NFPA 251 and ASTM E-119 allow this temperature to be determined by averaging thermocouple temperature readings. For the purposes of this criterion, thermocouple averaging can be used provided similar series of thermocouples (e.g., cable tray side rail) are averaged together to determine temperature performance of the raceway fire barrier system. In addition, conditions of acceptance are placed on the temperatures measured by a single thermocouple. If any single thermocouple exceeds 30 percent of the maximum allowable temperature rise (i.e., 139 °C ÷ 42 °C = 181 °F [250 °F ÷ 75 °F = 325 °F]), the test exceeded the temperature criteria limit.)

- Irrespective of the unexposed side temperature rise during the fire test, if cables or components are included in the fire barrier test specimen, a visual inspection should be performed.[7] Cables should not show signs of degraded conditions[8] resulting from the thermal affects of the fire exposure; and

  (Staff Guidance: For those cases where signs of thermal degradation are present, the fire barrier did not perform its intended fire-resistive function. For those barriers which are not capable of performing their intended function, a deviation based on demonstrating that the functionality of thermally degraded cables or component was maintained and that the cables or component would have adequately performed their intended function during and after a postulated fire exposure may be granted. The attachment to this position provides a methodology for demonstrating the functionality of cables during and after a fire test exposure. The purpose of the functionality tests is to justify observed deviations in fire barrier performance. For those fire barrier test specimens that are tested without cables,

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[7] When the temperature criteria are exceeded or damage occurs, component operability at the temperatures experienced during the fire test should be assessed. Fire endurance tests that are judged acceptable on the basis of a visual inspection of specific components or cables included in the test specimen may not be applied to other components or cables without a specific evaluation.

[8] Examples of thermal cable degradation are: jacket swelling, splitting, cracking, blistered, melted, or discoloration; shield exposed; conductor insulation exposed, degraded, or discolored; bare copper conductor exposed.

an engineering analysis justifying internal fire barrier temperature conditions greater than allowed can be based on a comparison of the fire barrier internal temperature profile measured during the fire endurance test to existing cable specific performance data, such as environmental qualification (EQ) tests.)

The cable tray, raceway, or component fire barrier system remained intact during the fire exposure and water hose stream test without developing any openings through which the cable tray, raceway, or component (e.g., cables) is visible. Section VII identifies acceptable hose stream test methods.

The test specimen should be representative of the construction for which the fire rating is desired as to materials, workmanship, and details such as dimensions of parts, and should be built under representative conditions. Raceway fire barrier systems being subjected to qualification fire endurance tests should be representative of the end use. For example, if it is intended to install a cable tray fire barrier system in the plant without protecting the cable tray supports, then the test program should duplicate these field conditions. In addition, the fire test program should encompass or bound raceway sizes and the various configurations for those fire barrier systems installed in the plant. It should be noted that several test specimens will be required in order to qualify various sizes of horizontal and vertical runs of cable trays and conduits, junction boxes and pull boxes, etc. The cable tray or raceway design used for the tests should be constructed with materials and configurations representative of in plant conditions (e.g., the mass associated with typical steel conduits and cable trays, representative internal and external penetration seals). If cables are included in the raceway fire barrier test specimen, these cables should be representative of the installed plant-specific cables.

Measuring cable temperatures is not a reliable means for determining excessive temperature conditions which may occur at any point along the length of the cable during the fire test. In lieu of measuring the unexposed surface temperature of the fire barrier test specimen, methods which will measure the surface temperature of the raceway (e.g., exterior of the conduit, side rails of cable trays, bottom and top of cable tray surfaces, junction box external surfaces) can be considered as equivalent if the raceway components used to construct the fire test specimen represent plant specific components and configurations. The metal surfaces of the raceway, under fire test conditions, exhibit good thermal conductivity properties. Temperatures measured on these surfaces provide a indication of the actual temperature rise within the fire barrier system.

In 1979, American Nuclear Insurers (ANI) issued a fire endurance test method for raceway fire barrier systems for insurance purposes. This method, "Fire Endurance Protective Envelope Systems for Class 1E Electrical Circuits," specified that cable temperatures be monitored by thermocouples. Industry considers this the proper location for determining the temperature rise within the raceway fire barrier system. Since cable jackets have a low thermal

conductivity, the actual local temperatures of the cable jackets indications of barrier failure and internal fire barrier temperature rise conditions during the fire exposure are masked. Monitoring cable temperatures can give indications of low internal fire barrier temperature conditions during the fire endurance test. Using this temperature monitoring approach, cable damage can occur without indication of excessive temperatures on the cables. This, linked with no loss of circuit integrity, would give indications of a successful test. The staff considers monitoring the cable temperature as the primary means of determining cable tray or raceway fire barrier performance to be nonconservative. Therefore, the staff has incorporated the provision for a post-fire visual inspection of cables that are installed in fire barrier test specimens. As discussed above, temperatures monitored on the exterior surface of the raceway provide a more representative indication of fire barrier performance.

Fire endurance tests of raceway fire barrier systems should be without cables. This method is preferred because by excluding cables from the test specimen it eliminates bias in the test results created by the thermal mass of the cables. Without this thermal mass, the internal temperature conditions measured by the test specimen thermocouples during the fire exposure will provide a more accurate determination of fire barrier thermal performance.

Thermocouple Placement - Test Specimens Containing Cables

The following are acceptable placements of thermocouples for determining the thermal performance of raceway or cable tray fire barrier systems that contain cables during the fire exposure:

Conduits - The temperature rise on the unexposed surface of a fire barrier system installed on a conduit should be measured by placing the thermocouples every 152 mm [6 inches][9] on the exterior conduit surface underneath the fire barrier material. The thermocouples should be attached to the exterior conduit surface located opposite the test deck and closest to the furnace fire source. Thermocouples should also be placed immediately adjacent to all structural members, supports, and barrier penetrations.

Cable Trays - The temperature rise on the unexposed surface of a fire barrier system installed on a cable tray should be measured by placing the thermocouples on the exterior surface of the tray side rails between the cable tray side rail and the fire barrier material. In addition to placing thermocouples on the side rails, thermocouples should be attached to two AWG 8 stranded bare copper conductors. The first copper conductor should be installed on the bottom of the cable tray rungs along the entire length and down the longitudinal center of the cable tray run. The second conductor should be installed along the outer top

[9] For the thermocouples installed on conduits, cable tray side rails, and bare copper conductors, a ±13 mm [±½ inch] installation tolerance is acceptable.

surface of the cables closest to the top and towards the center of the fire barrier. The bare copper wire is more responsive than cable jackets to temperature rise within the fire barrier enclosure. The temperature changes measured along the bare copper conductors provide indication of joint failure or material burn through conditions. Thermocouples should be placed every 152 mm [6 inches] down the longitudinal center along the outside surface of the cable tray side rails and along the bare copper conductors. Thermocouples should also be placed immediately adjacent to all structural members, supports, and barrier penetrations.

Junction Boxes (JB) - The temperature rise on the unexposed surface of a fire barrier system installed on junction boxes should be measured by placing thermocouples on either the inside or the outside of each JB surface. Each JB surface or face should have a minimum of one thermocouple, located at its geometric center. In addition, one thermocouple should be installed for every one square foot of JB surface area. These thermocouples should be located at the geometric centers of the one square foot areas. At least one thermocouple should also be placed within 25 mm [1 inch] of each penetration connector/interface.

Airdrops - The internal airdrop temperatures should be measured by thermocouples placed every 305 mm [12 inches] on the cables routed within the air drop and by a stranded AWG 8 bare copper conductor routed inside and along the entire length of the airdrop system with thermocouples installed every 152 mm [6 inches] along the length of the copper conductor. The copper conductor should be in close proximity with the unexposed surface of the fire barrier material. Thermocouples should also be placed immediately adjacent to all supports and barrier penetrations.

With the exception of airdrops, the installation of thermocouples on cables is optional and is left to the discretion of the licensee, test sponsor, or test laboratory. Cable thermocouples are to be used for engineering purposes only. Cable thermocouples alone are not acceptable for the demonstration of fire barrier performance. However, cable thermocouples may support fire barrier deviation conditions.

Temperature conditions on the unexposed surface of the fire barrier material during the fire test will be determined by averaging the temperatures measured by the thermocouples. In determining these cable tray or raceway temperature conditions, the thermocouples measuring similar fire barrier areas of performance should be averaged together and the basis of acceptance will be based on the individual averages. The following method of averaging should be followed:

Conduits - The thermocouples applied to the outside metal surface of the conduit should be averaged together.

Cable Trays - The thermocouples on each cable tray side rail should be averaged separately. For example, thermocouples placed on one side rail

will be averaged separately from the other side rail. In addition, the temperature conditions measured by thermocouples on the two bare copper conductors should be averaged separately.

Junction Boxes - For small JBs which have only one thermocouple placed on each JB surface, the individual JB surface thermocouples should be averaged together. For larger JBs which have more that one thermocouple placed on each JB surface, the thermocouples on the individual JB surfaces should be averaged together.

Airdrops - The thermocouples placed on the outer cable(s) routed in the airdrop fire barrier should be averaged together.

The averages of any thermocouple group during the fire test should not exceed 139 °C [250 °F] above the unexposed side temperature within the fire barrier test specimen at the onset of the fire endurance test. In addition, the temperature of each individual thermocouple will be evaluated. Individual thermocouple conditions should not exceed the 139 °C [250 °F] temperature rise by more than 30 percent.

Thermocouple Placement - Test Specimens Without Cables

The following are acceptable thermocouple placements for determining the thermal performance of raceway or cable tray fire barrier systems that do not contain cables:

Conduits - The temperature rise of the unexposed surface of a fire barrier system installed on a conduit should be measured by placing thermocouples every 152 mm [6 inches] on the exterior conduit surface between the conduit and the unexposed surface of the fire barrier material. These thermocouples should be attached to the exterior conduit surface opposite of the test deck and closest to the furnace fire source. The internal raceway temperatures should be measured by a stranded AWG 8 bare copper conductor routed through the entire length of the conduit system with thermocouples installed every 152 mm [6 inches] along the length of the copper conductor. Thermocouples should also be placed immediately adjacent to all structural members, supports, and barrier penetrations.

Cable Trays - The temperature rise on the unexposed surface of a fire barrier system installed on a cable tray should be measured by placing thermocouples every 152 mm [6 inches] on the exterior surface of each tray side rails between the side rail and the fire barrier material. Internal raceway temperatures should be measured by a stranded AWG 8 bare copper conductor routed on the top of the cable tray rungs along the entire length and down the longitudinal center of the cable tray run with thermocouples installed every 152 mm [6 inches] along the length of the copper conductor. Thermocouples should be placed immediately adjacent to all structural members, supports, and barrier penetrations.

Junction Boxes - The temperature rise on the unexposed surface of a fire barrier system installed on junction boxes should be measured by placing thermocouples on either the inside or the outside of each JB surface. Each JB surface or face should have a minimum of one thermocouple, located at its geometric center. In addition, one thermocouple should be installed for every one square foot of JB surface area. These thermocouples should be located at the geometric centers of the one square foot areas. At least one thermocouple should also be placed within 25 mm [1 inch] of each penetration connector/interface.

Airdrops - The internal airdrop temperatures should be measured by a stranded AWG 8 bare copper conductor routed inside and along the entire length of the airdrop system with thermocouples installed every 152 mm [6 inches] along the length of the copper conductor. The copper conductor should be in close proximity with the unexposed surface of the fire barrier material. Thermocouples should also be placed immediately adjacent to all supports and penetrations.

Temperature conditions on the unexposed surfaces of the fire barrier material during the fire test will be determined by averaging the temperatures measured by the thermocouples installed in or on the raceway. In determining these temperature conditions, the thermocouples measuring similar areas of the fire barrier should be averaged together. Acceptance will be based on the individual averages. The following method of averaging should be followed:

Conduits - The thermocouples applied to the outside metal surface of the conduit should averaged together.

Cable Trays - The thermocouples on each cable tray side rail should be averaged separately. For example, thermocouple placed on one side rail will be averaged separately from the other side rail. In addition, the temperature conditions measured by thermocouples on the bare copper conductor should be averaged separately from the side rails.

Junction Boxes - For JBs that have only one thermocouple on each JB surface, the individual JB surface thermocouples should be averaged together. For JBs that have more that one thermocouple on each JB surface, the thermocouples on the individual JB surfaces should be averaged together.

Airdrops - The thermocouples placed on the copper conductor within the airdrop fire barrier should be averaged together.

The average of any thermocouple group should not exceed 139 °C [250 °F] above the unexposed side temperature within the fire barrier test specimen at the onset of the fire endurance test. In addition, the temperature of each individual thermocouple will be evaluated. Individual thermocouple conditions should not exceed the 139 °C [250 °F] temperature rise by more than 30 percent.

a fire barrier test specimen without cables does not meet the average or imum single point temperature criteria, then the internal raceway temperature profile as measured by the instrumented bare copper conductors during the fire exposure can be used to assess cable functionality through air oven tests of plant specific cable types and construction.

VI. HOSE STREAM TESTS

NFPA 251 and ASTM E-119 allow flexibility in hose stream testing. The standards allow the hose stream test to be performed on a duplicate test specimen subjected to a fire endurance test for a period equal to one-half of that indicated as the fire resistance rating, but not for more than 1 hour (e.g., 30 minute fire exposure to qualify a 1-hour fire rated barrier).

For safe shutdown related fire barrier systems referenced in Section IV and duplicate electrical cable tray or raceway and component fire barrier test specimens that have been exposed to the ½-duration test fire exposure, the staff finds the hose stream application specified by the NFPA 251 acceptable. NFPA 251 requires the stream of water to be delivered through a 6.4 cm [2½-inch] hose discharging through a standard 2.9 cm [1⅛-inch] playpipe nozzle onto the test specimen after the fire exposure test. The stream is applied with the nozzle orifice positioned 6.1 meters [20 feet] away from the center of the test specimen at a pressure of 207 kPa [30 psi]. The application of the stream is to all exposed parts of the specimen for a minimum duration of 1 nute for a 1-hour barrier and 2½ minutes for a 3-hour barrier.

an alternate for electrical raceway fire barrier test specimens, the application of the hose stream test can be performed immediately after the completion of the full fire endurance test period. If this method is used to satisfy the hose stream test criteria, the following hose stream applications are acceptable:

- The stream applied at random to all exposed surfaces of the test specimen through a 6.4 cm [2½-inch] national standard playpipe with a 2.9 cm [1⅛-inch] orifice at a pressure of 207 kPa [30 psi] at a distance of 6.1 meters [20 feet] from the specimen. (Duration of the hose stream application - 1 minute for a 1-hour barrier and 2½ minutes for a 3-hour barrier); or

- The stream applied at random to all exposed surfaces of the test specimen through a 3.8 cm [1½-inch] fog nozzle set at a discharge angle of 30 degrees with a nozzle pressure of 517 kPa [75 psi] and a minimum discharge of 284 lpm [75 gpm] with the tip of the nozzle at a maximum of 1.5 meters [5 feet] from the test specimen. (Duration of the hose stream application - 5 minutes for both 1-hour and 3-hour barriers); or

- The stream applied at random to all exposed surfaces of the test specimen through 3.8 cm [1½-inch] fog nozzle set at a discharge angle of 15 degrees with a nozzle pressure of 517 kPa [75 psi] and

a minimum discharge of 284 lpm [75 gpm] with the tip of the nozzle at a maximum of 3 meters [10 feet] from the test specimen. (Duration of the hose stream application - 5 minutes for both 1-hour and 3-hour barriers.)

VII. FIRE BARRIER COMBUSTIBILITY

The NRC's fire protection guidelines and requirements establish the need for each nuclear power plant to perform a plant-specific fire hazard analysis. The fire hazard analysis should consider the potential for in-situ and transient fire hazards and combustibles. With respect to building materials (e.g., cable insulation and jackets, plastics, thermal insulation, fire barrier materials), the combustibility, ease of ignition, and flame spread over the surface of a material should be considered by the fire hazards analysis. One method of determining combustibility is by subjecting a sample of the fire barrier material to a small scale vertical tube furnace as described by ASTM E-136. The flashover ignition temperature of the material (as determined by ASTM D-1929) and the flame spread characteristics of the material (as determined by ASTM E-84) should also be evaluated. The potential heat release of the material (as determined by ASTM D-3286 or NFPA 259), should also be factored into the fire hazards analysis.

Fire barrier materials used as radiant energy heat shields inside containment and used to achieve a combustible free zone are required to be noncombustible as defined in Section III.

VIII. REFERENCES

U.S. Nuclear Regulatory Commission

May 1, 1976	Branch Technical Position (APCSB) 9.5-1, "Fire Protection Program."
February 24, 1977	Appendix A to the Branch Technical Position APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976."
February 19, 1981	10 CFR 50.48, "Fire protection."
February 19, 1981	Appendix R to 10 CFR Part 50, "Fire Protection for Nuclear Power Plants."
February 20, 1981	Generic Letter 81-12, "Staff Position - Safe Shutdown Capability."
July 1981	NUREG - 0800, Standard Review Plan, 9.5.1, "Fire Protection for Nuclear Power Plants."
October 19, 1983	Generic Letter 83-33, "NRC Positions on Certain Requirements of Appendix R to 10 CFR 50."

ril 24, 1986 Generic Letter 86-10, "Implementation of Fire Protection Requirements."

American Society for Testing and Materials

ASTM E-84, "Surface Burning Characteristics of Building Materials."

ASTM E-119, "Fire Test of Building Construction and Materials."

ASTM E-136, "Behavior of Materials in a Vertical Tube Furnace at 750°C."

ASTM D-1929, "Test Method for Ignition Properties of Plastics."

ASTM D-3286, "Test Method for Gross Calorific Value of Solid Fuel by the Isothermal-Jacket Bomb Calorimeter."

American Nuclear Insurers (ANI)

July 1979, ANI Information Bulletin No. 5 (79) test criteria for "Fire Endurance Protective Envelope Systems for Class 1E Electrical Circuits."

National Fire Protection Association (NFPA)

NFPA 251, "Standard Methods of Fire Tests of Building Construction and Materials."

259, "Standard Test Method for Potential Heat of Building Materials."

ACCEPTABLE METHODS FOR DEMONSTRATING FUNCTIONALITY OF CABLES PROTECTED BY RACEWAY FIRE BARRIER SYSTEMS DURING AND AFTER FIRE ENDURANCE TEST EXPOSURE

I. INTRODUCTION

The NRC considers fire barrier systems that meet the acceptance criteria adequate under NRC fire protection regulations. The licensee, where the criteria are not met, should submit an engineering analysis to the staff that clearly demonstrates the functionality of the protected cables. This engineering analysis should consider the cable insulation type, actual voltage and current conditions, cable function, and thermal affects on the cable and its ability to function. This evaluation should also consider cable operating temperatures within the fire barrier at the onset of the fire exposure.

II. CABLE CIRCUIT INTEGRITY TESTS

In 1979, American Nuclear Insurers (ANI) issued a fire endurance test method for raceway fire barrier systems for insurance purposes. This method, "Fire Endurance Protective Envelope Systems for Class 1E Electrical Circuits," specified a circuit integrity test. The intent of this test was to identify the onset of fire damage to the cables within the raceway fire barrier test specimen during the fire endurance test period. The circuit integrity test voltage is 8 to 10 volts DC; therefore the loss of circuit integrity under these voltage conditions may occur only as a result of a dead short or open circuit.

During fire tests of raceway fire barrier systems, thermal damage to the cables has been observed. This thermal damage has led to cable jacket and insulation degradation without the loss of circuit integrity as monitored using ANI criteria. Since cable voltages used for ANI circuit integrity tests do not replicate cable operating voltages, loss of cable insulation conditions can exist during the fire test without a dead short occurring. It is expected that if the cables were at rated power and current, a fault would propagate. The use of circuit integrity monitoring during the fire endurance test is not a valid method for demonstrating that the protected shutdown circuits are capable of performing their required function during and after the test fire exposure. Therefore, circuit integrity monitoring is not required to satisfy NRC acceptance criteria for fire barrier qualification.

III. EQUIPMENT QUALIFICATION

Comparison of the fire barrier internal time-temperature profile measured during the fire endurance test to existing cable performance data, such as data from environmental qualification (EQ) tests, could be proposed to the staff as a method for demonstrating cable functionality. EQ testing is typically performed to rigorous conditions, including rated voltage and current. By correlating the EQ test time-temperature profile to the fire test time-temperature profile, the EQ test data would provide a viable mechanism to ensure cable functionality. A large body of EQ test data for many cable types

ists today. The use of EQ data represents a cost-effective approach for addressing cable functionality for fire tests for those cases where the 163 °C [325 °F] limit is exceeded.

The staff agrees that a comparison of fire test temperature profiles to existing EQ and Loss of Cooling Accident (LOCA) test results or air oven test results is an acceptable approach to demonstrate cable functionality provided the subject analysis incorporates the anticipated temperature rise due to self heating effects of installed power cables with the fire test results.

IV. CABLE INSULATION TESTS

The two principal materials used as cable insulation and cable jackets by the nuclear industry are thermoplastics and thermosetting polymeric materials. A thermoplastic material can be softened and resoftened by heating and reheating. Conversely, thermosetting cable insulation materials cure by chemical reaction and do not soften when heated. Under excessive heating thermosetting insulation becomes stiff and brittle. Electrical faults may be caused by softening and flowing of thermoplastic insulating materials at temperatures as low as 149 °C [300 °F]. Thermosetting electrical conductor insulation materials usually retain their electrical properties under short-term exposures to temperatures as high as 260 °C [500 °F]. Insulation resistance (Megger) tests provide indications of the condition of the cable insulation resistance, whereas the high potential (Hi-Pot) test provides assurance that the cable has sufficient dielectric strength to withstand the applied rated voltage. A cable insulation failure usually results from two breakdown modes: one failure mode is excessive dielectric loss which is due to low insulation resistance, and the other failure mode is overpotential stress which is due to loss of dielectric strength of the insulation material.

If Megger tests are not performed at frequent intervals during the fire exposure, indications of insulation damage in insulation may go undetected. When removed from elevated temperatures, insulation will reset. Megger tests of insulated cables after the fire endurance test and after the cable has sufficiently cooled may not detect degradation in the insulation resistance. Therefore, wet or dry Megger of cables after a fire exposure does not provide reasonable assurance that the cables would have functioned as intended during the fire exposure.

To provide reasonable assurance that the cables would have functioned during and after the fire exposure, Megger tests need to be performed before the fire test, at multiple time intervals during the fire exposure (i.e, every 20 minutes during the 1-hour fire test and every hour during the 3-hour fire test) for instrumentation cables only, and immediately after the fire endurance test to assess the cable insulation resistance levels. This testing will assure that the cables will maintain the insulation resistance levels necessary for proper operation of instruments.

The Megger tests (pre-fire, during the fire [if performed], and immediately after the fire test conditions) should be done conductor-to-conductor for multi-conductor and conductor-to-ground for all cables. The minimum

acceptable insulation resistance (IR) value, using the test voltage values as shown in the table below, is determined by using the following expression:

$$\text{IR (Mega-ohms)} \geq \frac{\{[K \div 1 \text{ Mega-ohm }] * 1000 \text{ (ft) }\}}{\text{Length (ft)}}$$

Where K = 1 Mega-ohm/KV * Operating Voltage (expressed in KV)

In addition, to determine the insulation resistance levels required for nuclear instrumentation cables, an assessment of the minimum insulation resistance value (e.g., one mega-ohm) and its potential impact on the functionality of these cables should be evaluated. An ac or dc high potential (Hi-Pot) test for power cables greater than 1000 volts (V) should also be performed after the post-fire Megger tests to assess the dielectric strength. This test provides assurance that the cable will withstand the applied voltage during and after a fire. The high potential test should be performed for a 5 minute duration at 60 percent of either 80 V/mil ac or 240 V/mil dc (e.g., 125 mil conductor insulation thickness x 240 V/mil dc x 0.6 = 18,000 V dc).

The table below summarizes the Megger and Hi-Pot test voltages[10] which, when applied to power, control and instrumentation cables, would constitute an acceptable cable functionality test.

TYPE	OPERATING VOLTAGE	MEGGER TEST VOLTAGE	HIGH POTENTIAL TEST VOLTAGE
Power	≥ 1000 V ac	2500 V dc	60% x 80 V/mil (ac) 60% x 240 V/mil (dc)
Power	< 1000 V ac	1500 V dc*	None
Instrument and Control	≤ 250 V dc ≤ 120 V ac	500 V dc	None

* A Megger test voltage of 1000 V dc is acceptable provided a Hi-Pot test is performed after the Megger test for power cables rated at less than 1000 V ac.

The electrical cable functionality tests recommended above are one acceptable method. Alternate methods to assess degradation of cable functionality will be evaluated by the staff for acceptability on a case-by-case basis. The above table summarizing the Megger and Hi-Pot test voltages are "typical" and the applicant can follow the applicable industry standards and manufacturer's recommendations for the specific cable application in the performance of the insulation resistance and Hi-Pot tests.

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[10] The review guidance for Megger and Hi-Pot test voltages was derived from IEEE 383-1974, IEEE 422-1986 and IEEE 690-1984.

V. AIR OVEN TESTS

Air oven tests can be used to evaluate the functionality of cables for those cable tray or raceway fire barrier test specimens tested without cables. This testing method consists of exposing insulated wires and cables at rated voltage to elevated temperatures in a circulating air oven. The temperature profile for regulating the temperature in the air oven during this test is the temperature measured by the AWG 8 bare copper conductor during the fire exposure of those cable tray or raceway test specimen which were tested without cables.

The staff finds the test method described by UL Subject 1724, "Outline of Investigation for Fire Tests for Electrical Circuit Protective Systems", Issue Number 2, August 1991, Appendix B, "Qualification Test for Circuit Integrity of Insulated Electrical Wires and Cables in Electrical Circuit Protection Systems", with the following modifications, acceptable:

1. During the air oven test the cables are to be energized at rated voltage. The cables are to be monitored for conductor-to-conductor faults in multi-conductor cables and conductor-to-ground faults in all conductors.

2. The cables being evaluated should be subjected to the Megger and high potential tests, recommended above in Section IV, "Cable Insulation Tests."

3. The impact force test, which simulates the force of impact imposed on the raceway by the solid stream test, described in UL 1724, Appendix B, paragraph B3.16, is not required to be performed.

VI. CABLE THERMAL EXPOSURE THRESHOLD

The following analysis, which is based on determining whether a specific insulation material will maintain electrical integrity and operability within a raceway fire barrier system during and after an external fire exposure, is an acceptable method for evaluating cable functionality. In order to determine cable functionality, it is necessary to consider the operating cable temperatures within the fire barrier system at the onset of the fire exposure and the thermal exposure threshold (TET) temperature of the cable. For example, if the TET of a specific thermoplastic cable insulation (Brand X) is 149 °C [300 °F] and the normal operating temperature within the fire barrier system is 66 °C [150 °F], then the maximum temperature rise within the fire barrier system should not exceed 83 °C [150 °F] during exposure to an external fire of a duration equal to the required fire resistance rating of the barrier. For this example the TET limit for Brand X cable is 83 °C [150 °F] above the cable operating temperatures within the fire barrier system at the onset of the external fire exposure. The cable TET limits in conjunction with a post test visual cable inspection and the Hi-Pot test described above should readily demonstrate the functionality of the cable circuit during and after a fire.

The normal cable operating temperature can be determined by loading cable specimens installed within a thermal barrier system in the test configuration with rated voltage and current. The TET temperature limits for most cable insulation may be obtained from the manufacturer's published data which is given as the short-circuit rating limit. With the known TET and normal operating temperature for each thermal barrier system configuration, the maximum temperature rise limit within a fire barrier system may then be determined.

COMPARISON OF FIRE ENDURANCE TEST CRITERIA
FOR FIRE BARRIER SYSTEMS USED TO SEPARATE
SAFE SHUTDOWN FUNCTIONS WITHIN THE SAME FIRE AREA

GL 86-10, SUPP. 1	GL 86-10	RATIONALE FOR CLARIFICATION
Temperature, as measured on the external surface of the Raceway, should not exceed 163 °C [325 °F] (Note 1). This temperature is determined by averaging temperature readings of similar series of thermocouple (e.g., cable tray side rail) (Note 2).	Temperature, as measured on the unexposed side of the fire barrier material, should not exceed 163 °C [325 °F].	Temperature - Difficult to measure a uniform temperature on the fire barrier material surface. Raceway temps provide good indication of internal temp-rise and potential barrier failure locations during the test.
Barrier Condition - Fire barrier should remain intact. No visible signs of component, raceway or cables after fire and hose stream test.	Barrier Condition - The barrier should have withstood the fire and hose stream test without the passage of flame or hot gasses hot enough to ignite cotton waste.	Barrier Condition - Cotton waste has not been used in raceway fire barrier testing as an indicator of barrier failure. Visual inspection process provides a better indication of barrier condition after the fire and hose stream test.
Hose Stream Test - solid stream test as specified in NFPA 251 on second test specimen after being subjected to a fire exposure of 1/2 duration (Note 4) or a fog stream after the full fire exposure.	Hose Stream Test - solid stream test as specified in NFPA 251.	Hose Stream Test - To reflect alternative methods found acceptable (Note 3). The use of a fog nozzle for the hose stream at the end of a full duration of the fire test provides a good method for testing erosion and cooling effects.

86-10, SUPP. 1	GL 86-10	RATIONALE FOR CLARIFICATION
Cable condition - When cables are included in the test specimen, post-fire condition must be visually inspected. Cables should show no signs of degraded conditions resulting from the thermal affects of the fire exposure.	Cable condition - No consideration given to determining the material condition of the cable.	Cable condition - The objective of these fire barriers is to assure that thermal damage to protected safe shutdown cables or components does not occur.

GUIDANCE FOR ENGINEERING EVALUATIONS JUSTIFYING DEVIATIONS FROM THE FIRE BARRIER ACCEPTANCE CRITERIA

Functionality should be demonstrated if any of the preceding criteria are exceeded (Note 5). ethods when cables are cluded from test specimen: Comparison of internal temp. profiles to EQ and LOCA test data. Air oven test of cables at rated voltage with Megger and Hi-Pot tests (Note 6) Method when cables are in test specimen include megger and Hi-Pot testing (Note 7) Demonstration of functionality should also consider operating temperature of the cables inside the fire barrier at the onset of the fire exposure.	Functionality - No guidance provided. Up to licensees to demonstrate by engineering analysis. Analysis kept on file for NRC review. Engineering analysis generally based on internal temperature below the ignition temperature. No consideration given cable operating temperatures within the barrier at the onset of the fire exposure.	Functionality is considered to be a deviation from the acceptance criteria and must be justified on a case-by-case basis which includes an assessment of cable jacket material.

Note 1: The 163 °C [325 °F] temperature condition was established by allowing the internal temperature on the raceway surface to rise a maximum of 139 °C [250 °F] above the initial temperature of the test specimen (assumed to be 24 °C [75 °F]).

Note 2: NFPA 251/ASTM-E119 allows the temperature condition to be determined by averaging the thermocouple readings. The conditions of acceptance are also placed on the temperature conditions measured by a single thermocouple. Under these conditions of acceptance, if any single thermocouple exceeds 30 percent above the maximum allowable temperature rise (i.e., max. allowable 139 °C + 42 °C = 181 °C [250 °F + 75 °F = 325 °F]) the test is considered to have exceeded the criteria temperature limit.

Note 3: SRP 9.5.1 recognizes the use of a fog stream as an alternative hose stream testing method for qualifying fire barrier penetration seals.

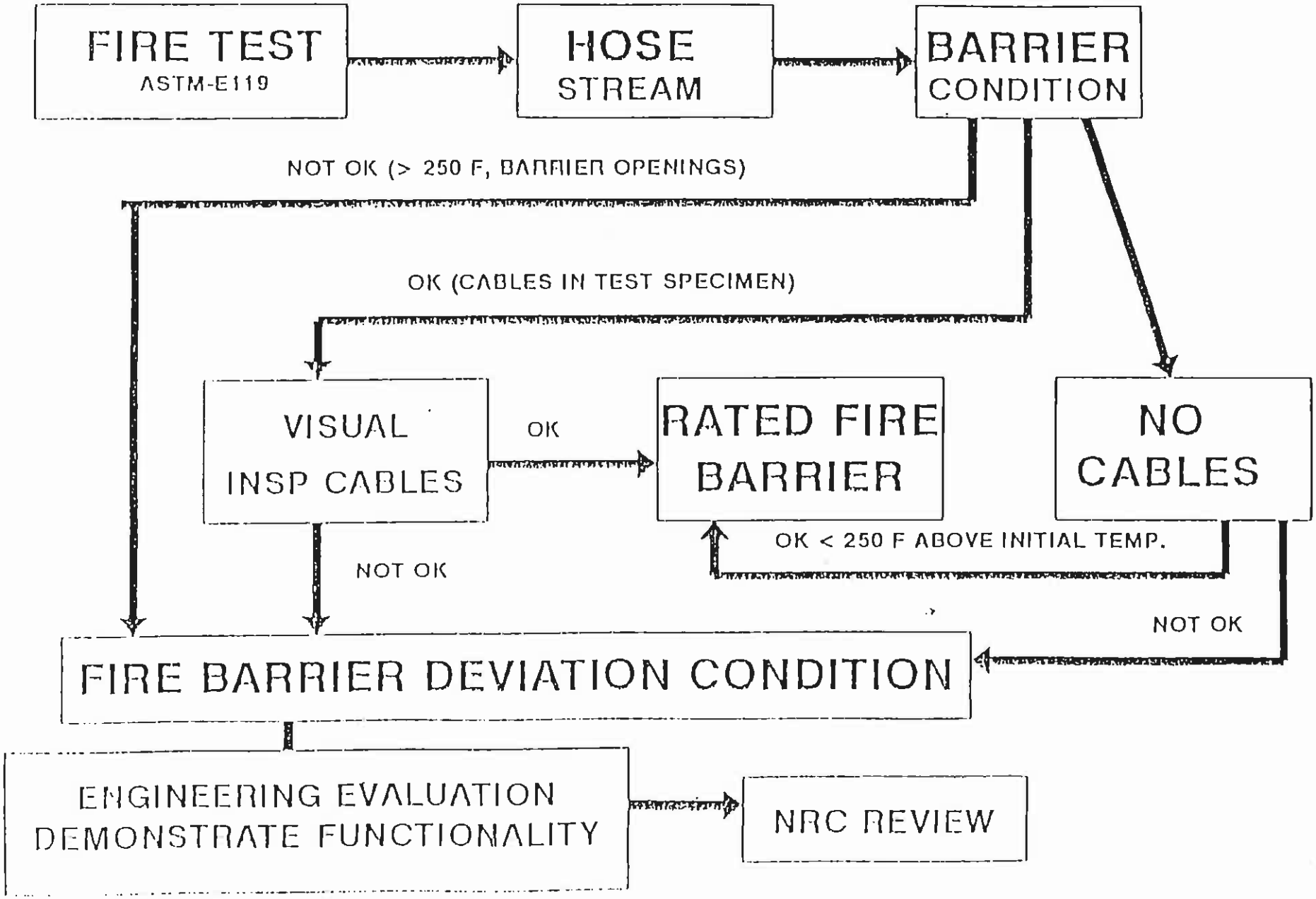
Note 4: This hose stream test method provides assurance that the cable tray or raceway fire barrier system has sufficient structural integrity to resist minor fire related barrier breaches caused by falling objects.

Note 5: A fire barrier system that does not meet the acceptance criteria is not considered a rated fire barrier. For those conditions (e.g., high raceway temperature, barrier openings, water projection, cable damage) which deviate from the acceptance criteria, an engineering analysis which clearly demonstrates the functionality of the protected components or cables should be submitted to the staff for review. The purpose of the recommended functionality tests is to justify observed deviations in fire barrier performance. Engineering analyses justifying these deviations should not rely substantially upon the equipment (e.g., cable) qualification as the basis for acceptance. Deviations will be evaluated by the staff on a case-by-case basis.

Note 6: For fire barrier systems tested without cables, plant-specific cable types should be subjected to air oven tests when the fire barrier temperature rise criteria are exceeded. These cables will be exposed to a temperature profile as determined by the internal raceway thermocouples during the fire test. Cables will be tested at rated voltage. Megger and Hi-Pot testing should be performed in a consistent manner to those tests performed for cables included in a fire barrier test specimen and subjected to the fire endurance test.

Note 7: Megger tests of cables included in the fire test specimen should be performed before, during (instrumentation cables only) and immediately after the fire exposure and subjecting power cables which have voltage ratings $\geq$ 1000 volts ac to a Hi-Pot test (60 percent) immediately after the fire exposure.

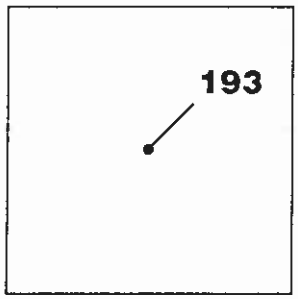
LOGIC DIAGRAM



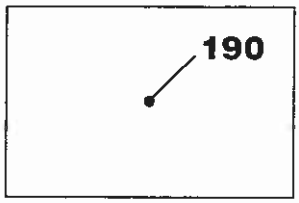
Appendix C

THERMOCOUPLE LOCATIONS

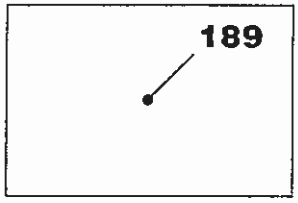
OMEGA POINT LABORATORIES



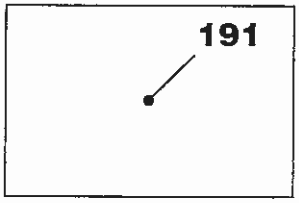
BOTTOM



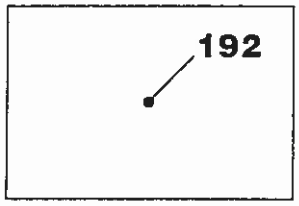
NORTH SIDE



SOUTH SIDE



EAST SIDE



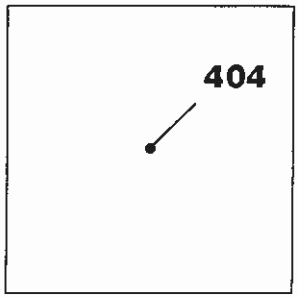
WEST SIDE

Note:
Thermocouples were placed on each side and the bottom of the 8" x 12" x 12" junction box, each located at the center of each panel.

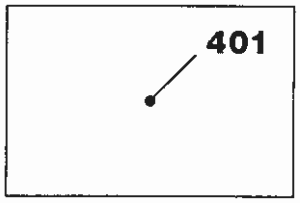
OMEGA POINT LABORATORIES, INC. Project No. 8610-102570 PCI/PROMATEC, INC. Fig. 9 JB #1 Thermocouples	
Drwn by: D.N. Priest	Date: 1/30/98
Apprvd by: C Patton	Date: 5/18/98
PCI/Promatec:	Date: 5/19/98

Scale: 1-1/2"=1'

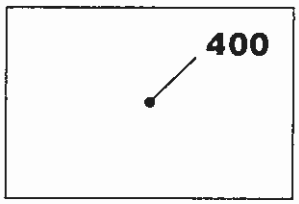
OMEGA POINT LABORATORIES



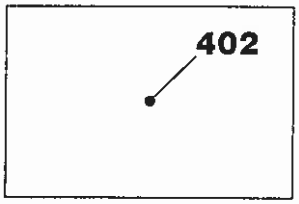
BOTTOM



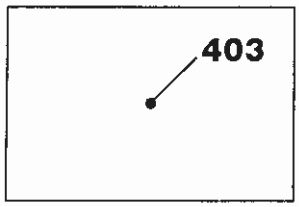
NORTH SIDE



SOUTH SIDE



EAST SIDE



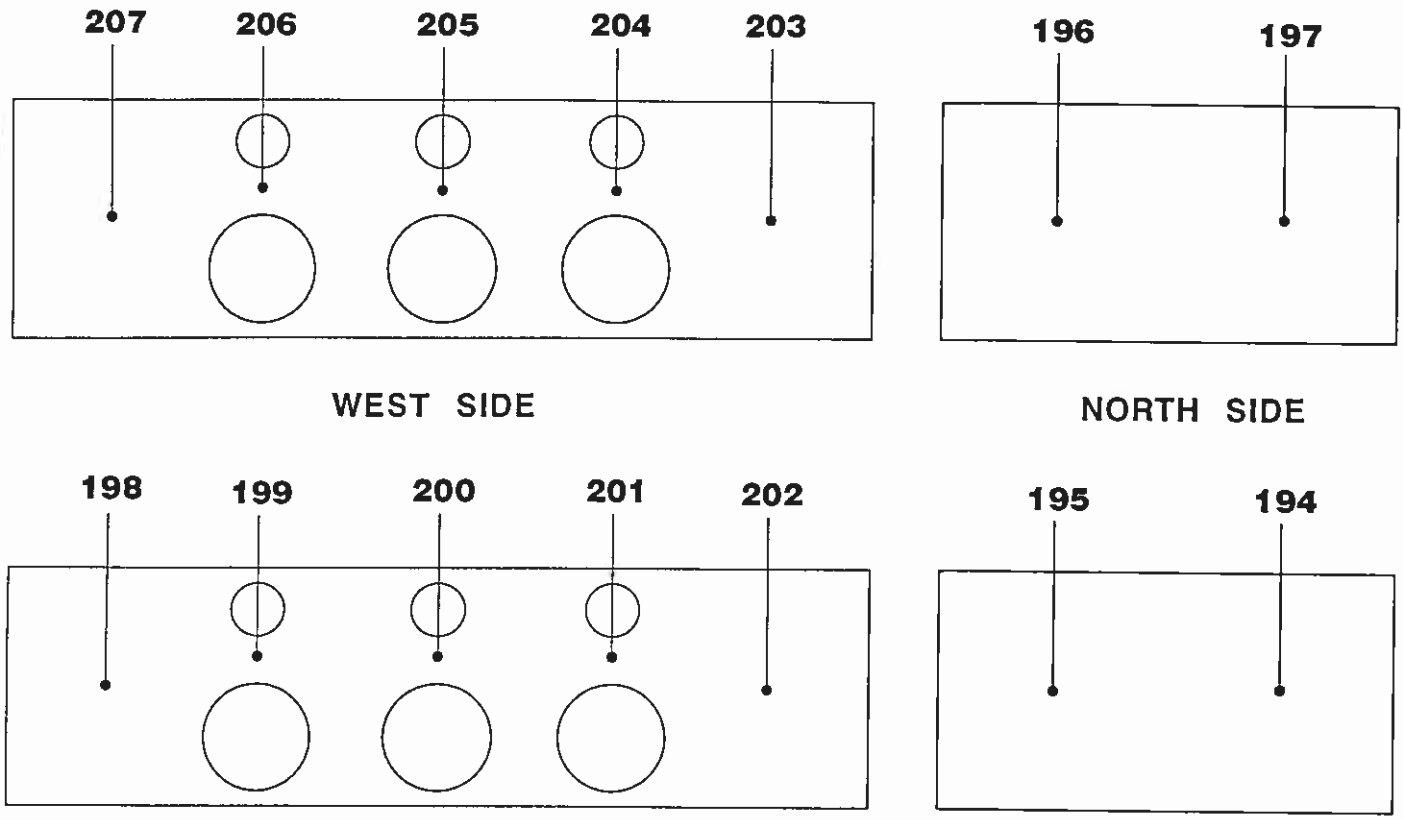
WEST SIDE

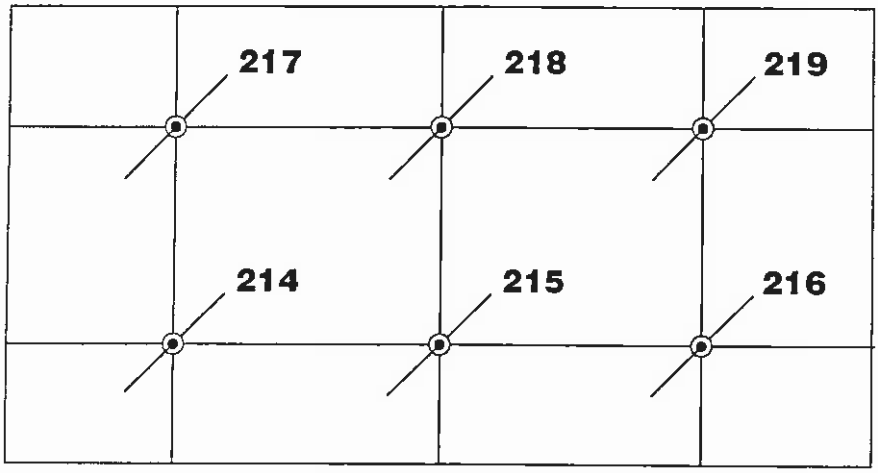
Note:
Thermocouples were placed on each side and the bottom of the 8" x 12" x 12" junction box, each located at the center of each panel.

OMEGA POINT LABORATORIES, INC. Project No. 8610-102570 PCI/PROMATEC, INC. Fig. 10 JB #2 Thermocouples	
Drwn by: D.N. Priest	Date: 1/30/98
Apprvd by:	Date: 5/18/98
PCI/Promatec:	Date: 5/19/98

Scale: 1-1/2"=1'

OMEGA POINT LABORATORIES





ELEVATION VIEW
OF TOP AND BOTTOM

= Thermocouples on bottom

= Thermocouples on top

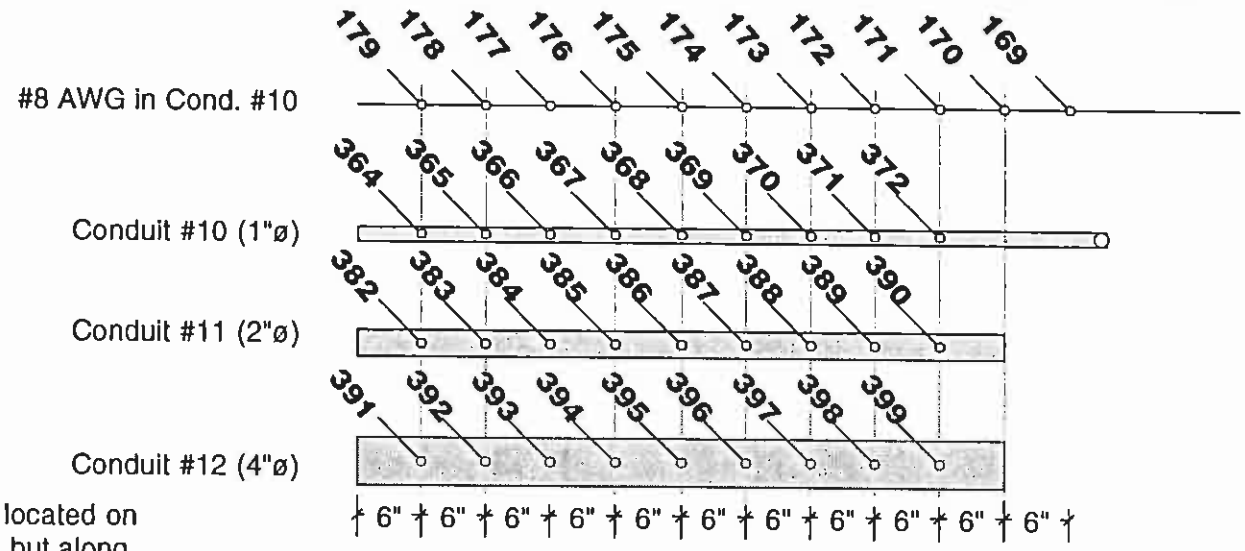
OMEGA POINT LABORATORIES, INC.
Project No. 8610-102570
PCI/PROMATEC, INC.
Fig.11 JB #3 Thermocouples

Drwn by: D.N. Priest	Date: 1/30/98
Apprvd by:	Date: 5/18/98
PCI/Promatec:	Date: 5/19/98

Scale: 1-1/2"=1'

OMEGA POINT LABORATORIES

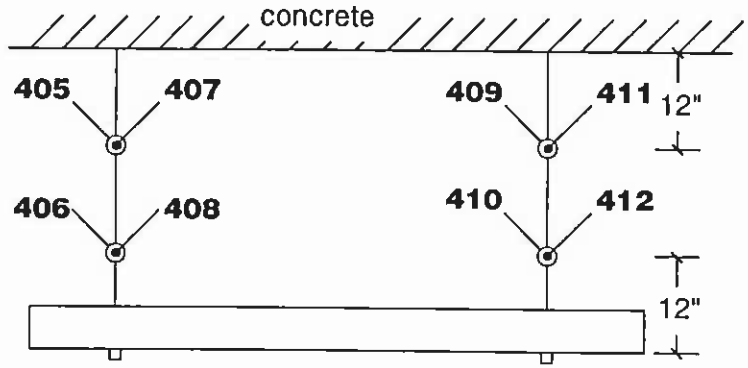
spans the big furnace (SOUTH SIDE)



WEST SIDE

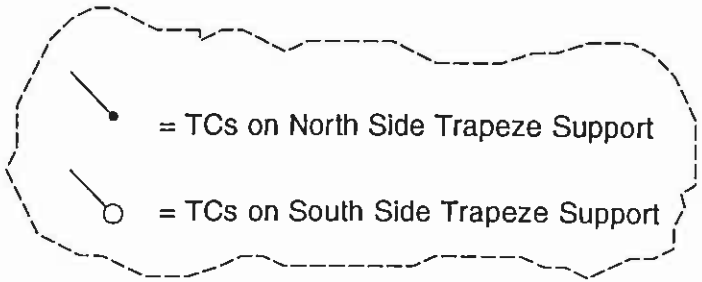
Note:
Thermocouples are located on the pipes as shown, but along the bottom.
Conduit #10 (1"ø) was also fitted with a bare #8 AWG copper conductor with thermocoules located every 6" as indicated.

Note:
Two thermocouples were placed on each trapeze support legs, one located 12" up from the bottom and one 12" down from the slab surface.



Elevation - not to scale

NORTH SIDE



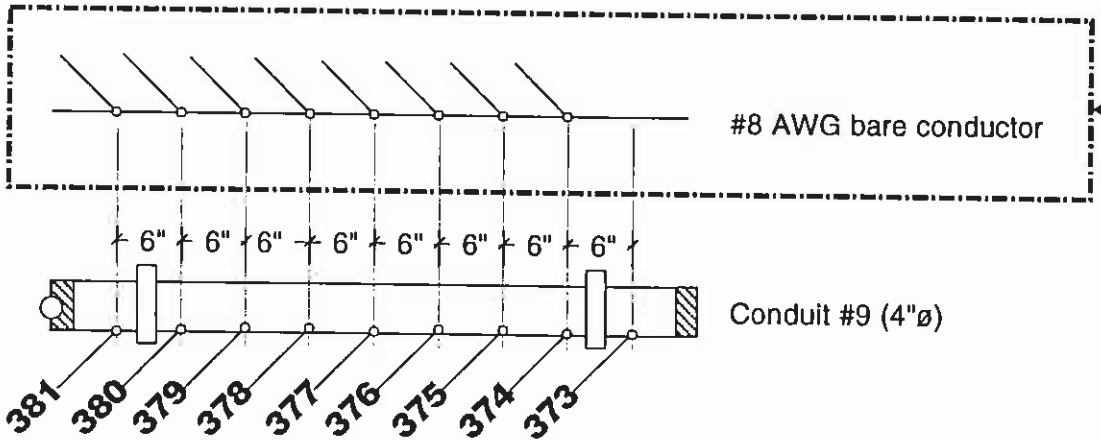
OMEGA POINT LABORATORIES, INC.
Project No. 8610-102570
PCI/PROMATEC, INC.
Fig. 12 Conduits #10-12 Thermocouples

Drwn by:	D.N. Priest	Date: 1/20/98
Apprvd by:		Date: 5/18/98
PCI/Promatec:		Date: 5/19/98

Scale: 3/4"=1'

OMEGA POINT LABORATORIES

spans the big furnace (SOUTH SIDE)



Note:
The bare #8 AWG cable with these thermocouples on it was erroneously left out of the conduit and could not be positioned after the cladding was installed.

WEST SIDE

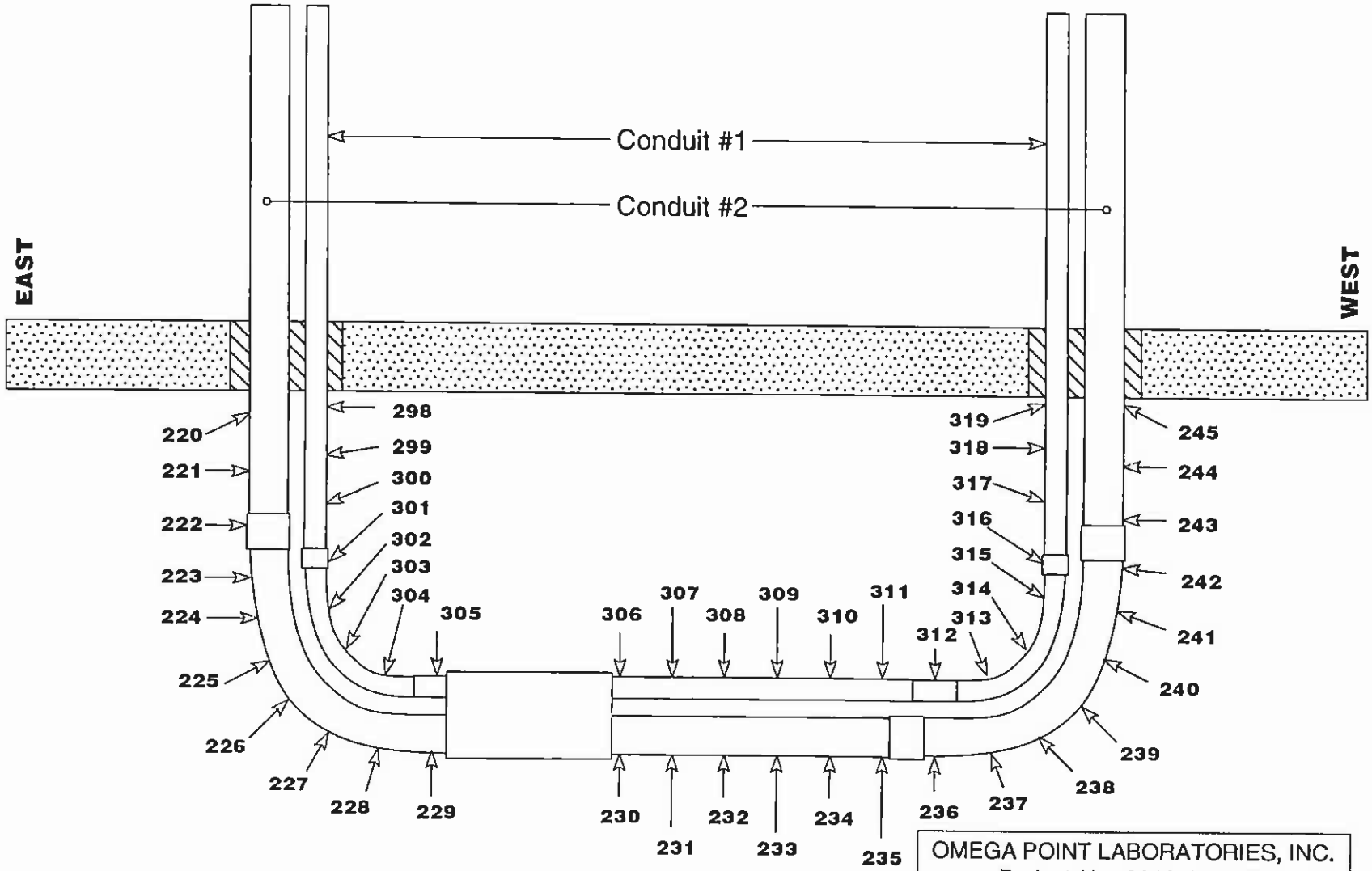
Note:
Thermocouples are located on the pipe as shown, but along the bottom.
Conduit #9 (4"ø) was also fitted with a bare #8 AWG copper conductor with thermocoules located every 6" as indicated.

NORTH SIDE

OMEGA POINT LABORATORIES

OMEGA POINT LABORATORIES, INC.		
Project No. 8610-102570		
PCI/PROMATEC, INC.		
Fig. 13 Conduit #9 Thermocouples		
Drwn by:	D.N. Priest	Date: 1/20/98
Apprvd by:	[illegible]	Date: 5/18/98
PCI/Promatec:	[illegible]	Date: 5/19/98

Scale: 3/4"=1'

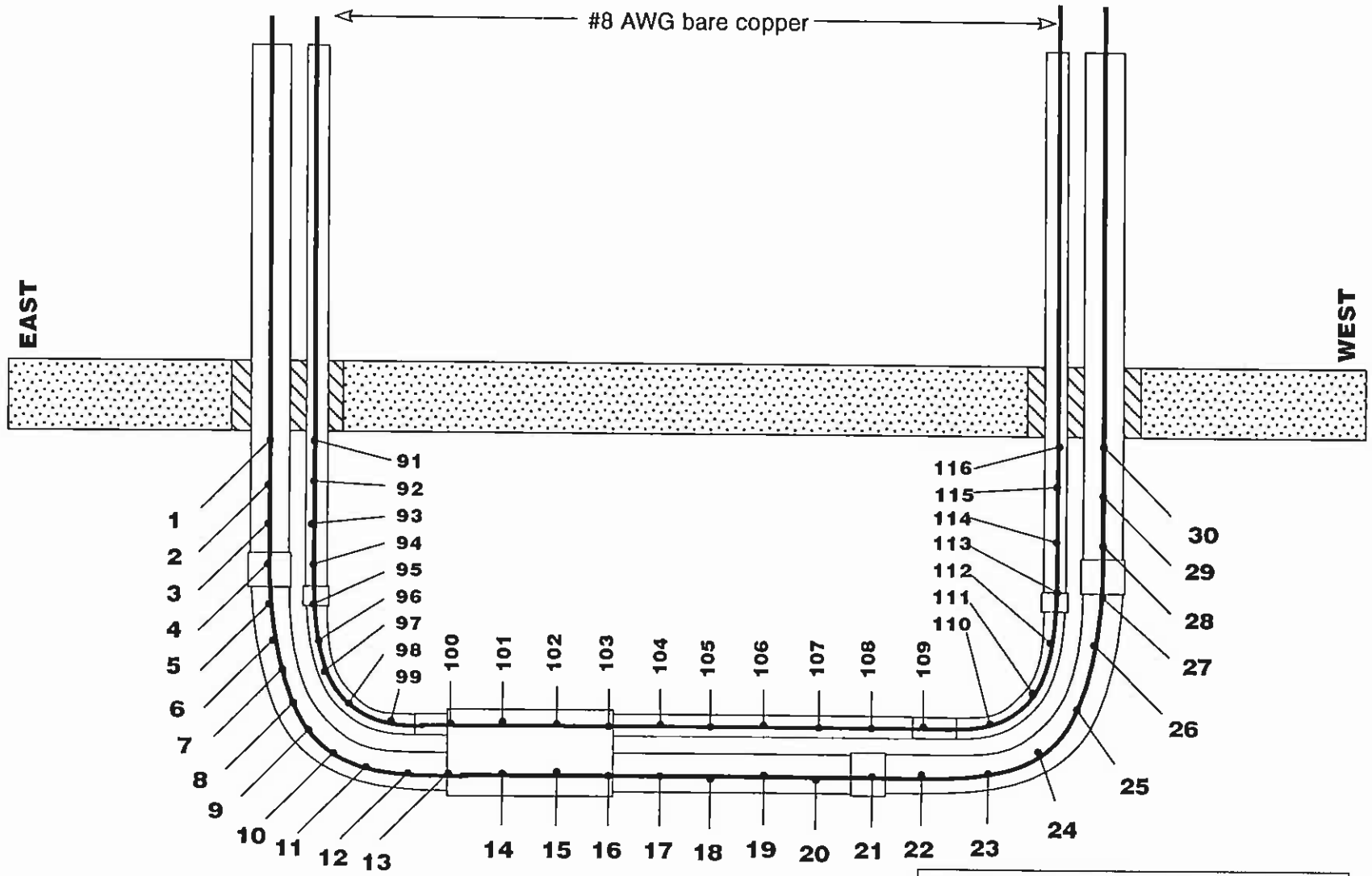


OMEGA POINT LABORATORIES

OMEGA POINT LABORATORIES, INC.
Project No. 8610-102570
PCI/PROMATEC, INC.
Fig. 14 TCs on Conds. 1 & 2

Drwn by:	D.N. Priest	Date: 1/20/98
Apprvd by:		Date: 5/18/98
PCI/Promatec:		Date: 5/19/98

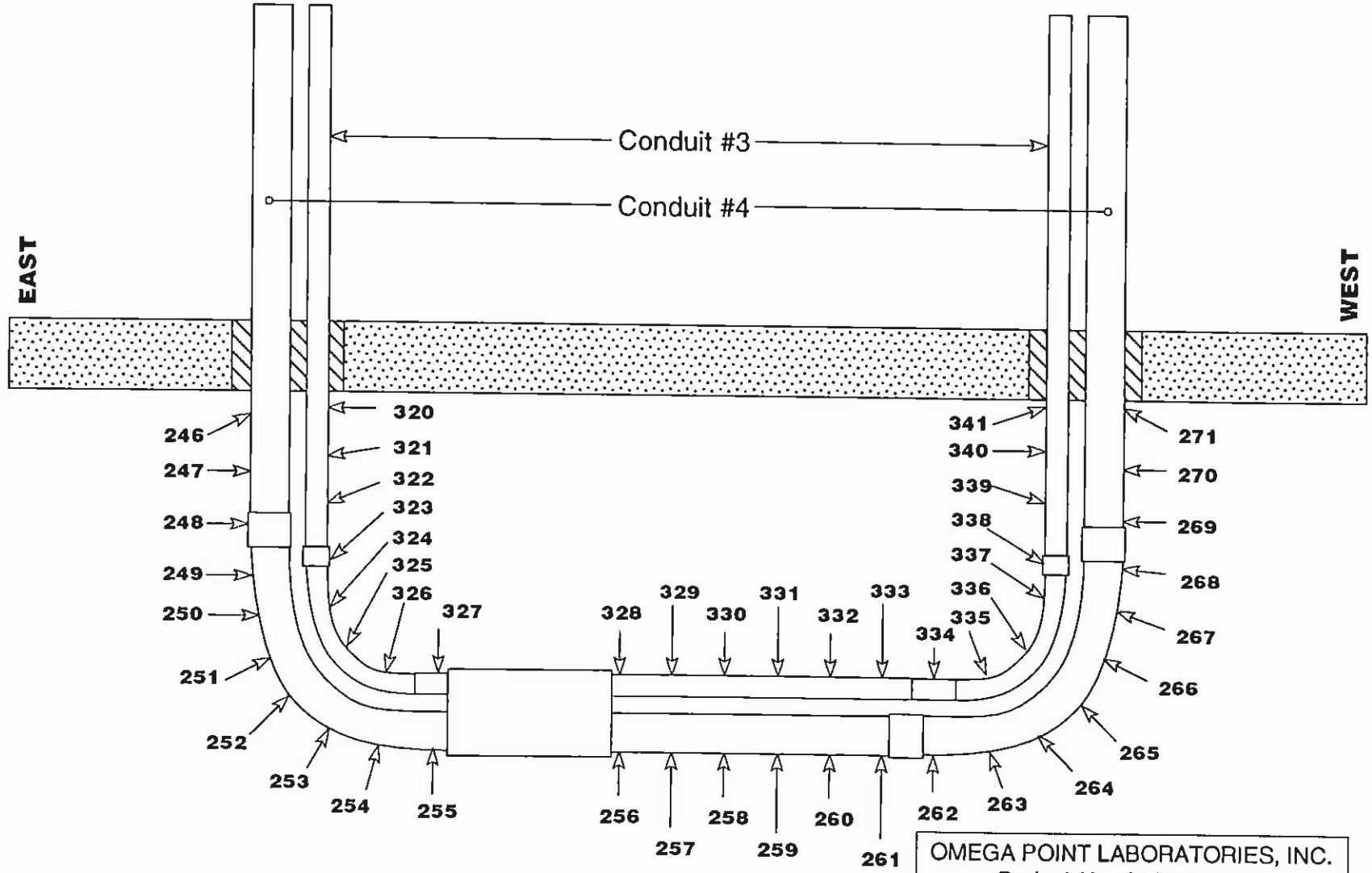
Scale: 3/4"=1'



OMEGA POINT LABORATORIES

OMEGA POINT LABORATORIES, INC.		
Project No. 8610-102570		
PCI/PROMATEC, INC.		
Fig. 15 TCs on #8 AWG: Conds. 1 & 2		
Drwn by:	D.N. Priest	Date: 1/20/98
Apprvd by:		Date: 5/18/98
PCI/Promatec:		Date: 5/19/98

Scale: 3/4"=1'

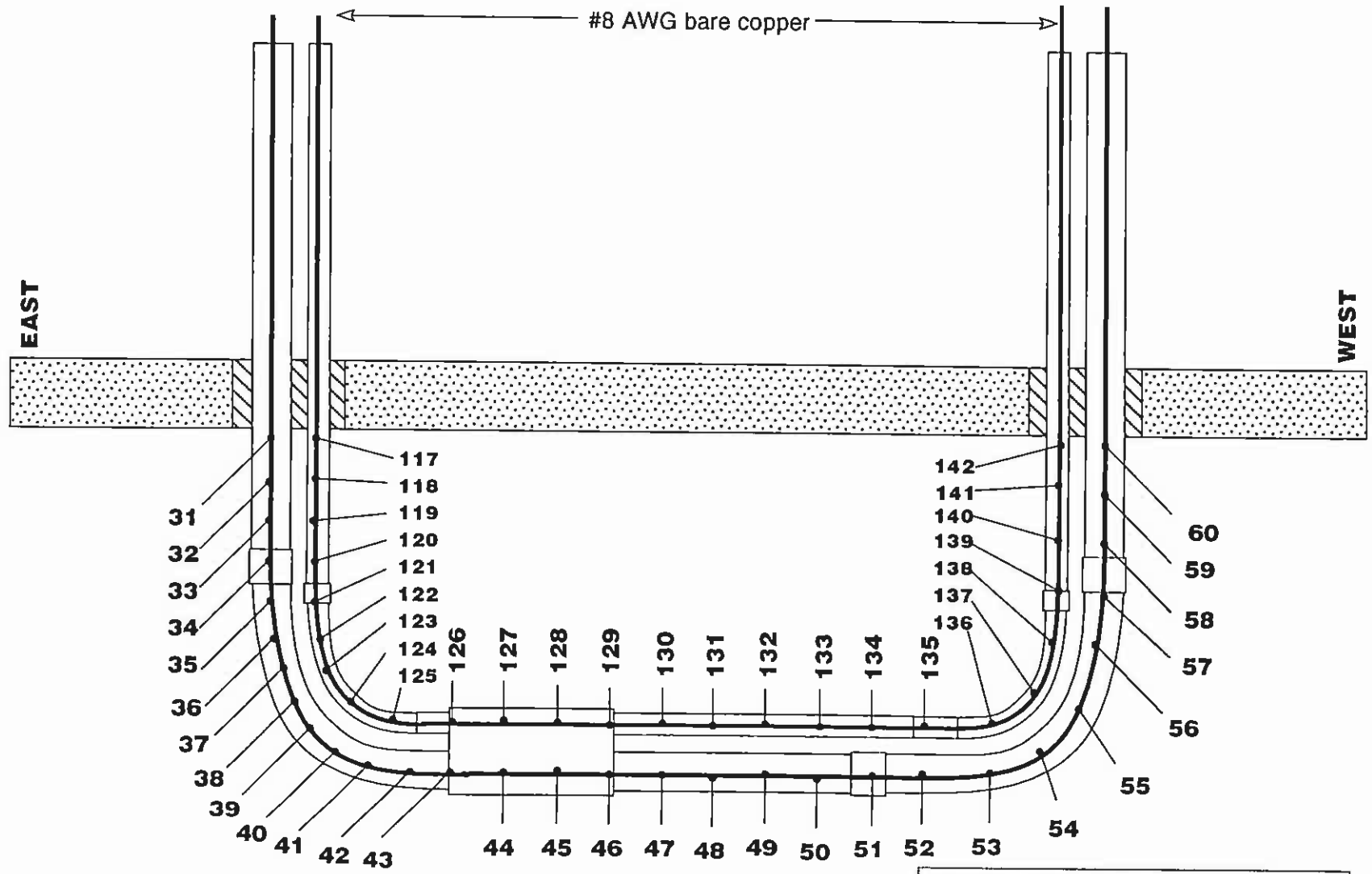


OMEGA POINT LABORATORIES

OMEGA POINT LABORATORIES, INC.
Project No. 8610-102570
PCI/PROMATEC, INC.
Fig. 16 TCs on Conds. 3 & 4

Drwn by:	D.N. Priest	Date: 1/20/98
Apprvd by:		Date: 5/18/98
PCI/Promatec:		Date: 5/19/98

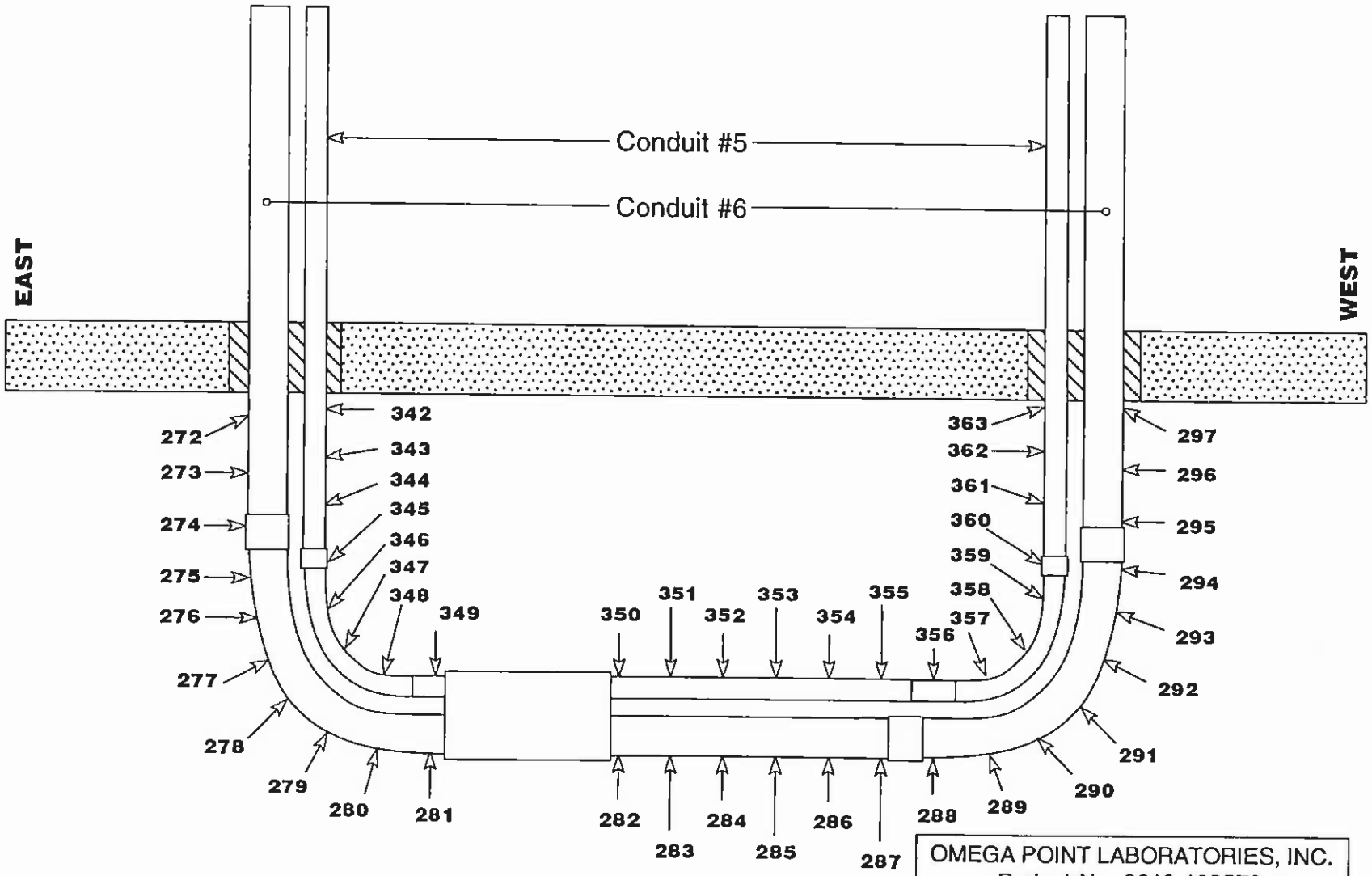
Scale: 3/4"=1'



OMEGA POINT LABORATORIES

OMEGA POINT LABORATORIES, INC.		
Project No. 8610-102570		
PCI/PROMATEC, INC.		
Fig. 17 TCs on #8 AWG: Conds. 3 & 4		
Drwn by:	D.N. Priest	Date: 1/20/98
Apprvd by:		Date: 5/19/98
PCI/Promatec:		Date: 5/19/98

Scale: 3/4"=1'

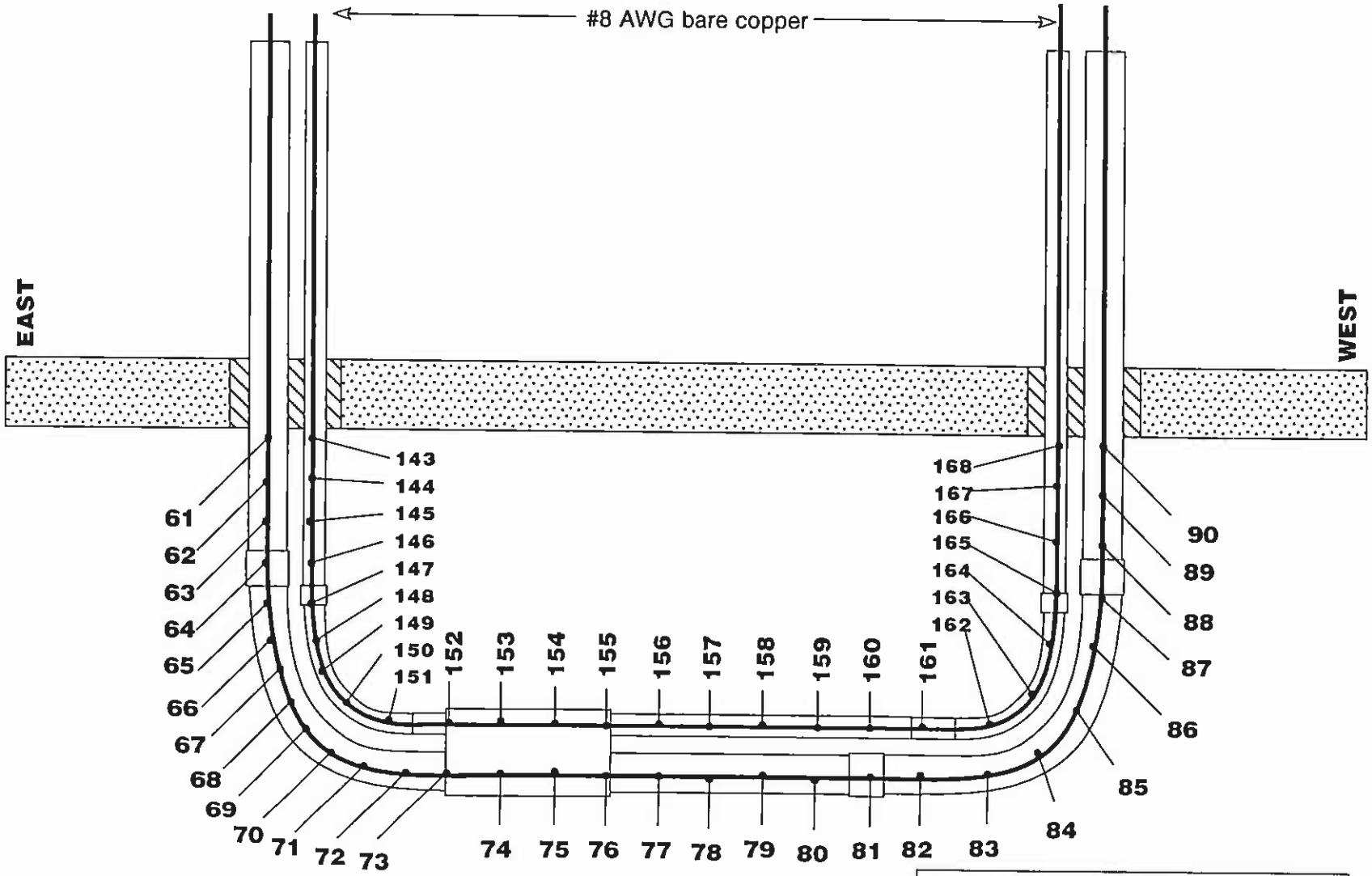


OMEGA POINT LABORATORIES

OMEGA POINT LABORATORIES, INC.
Project No. 8610-102570
PCI/PROMATEC, INC.
Fig. 18 TCs on Conds. 5 & 6

Drwn by:	D.N. Priest	Date: 1/20/98
Apprvd by:		Date: 5/18/98
PCI/Promatec:		Date: 5/19/98

Scale: 3/4"=1'



OMEGA POINT LABORATORIES

OMEGA POINT LABORATORIES, INC.		
Project No. 8610-102570		
PCI/PROMATEC, INC.		
Fig. 19 TCs on #8 AWG: Conds. 5 & 6		
Drwn by: D.N. Priest		Date: 1/20/98
Apprvd by:		Date: 5/18/98
PCI/Promatec:		Date: 5/14/98

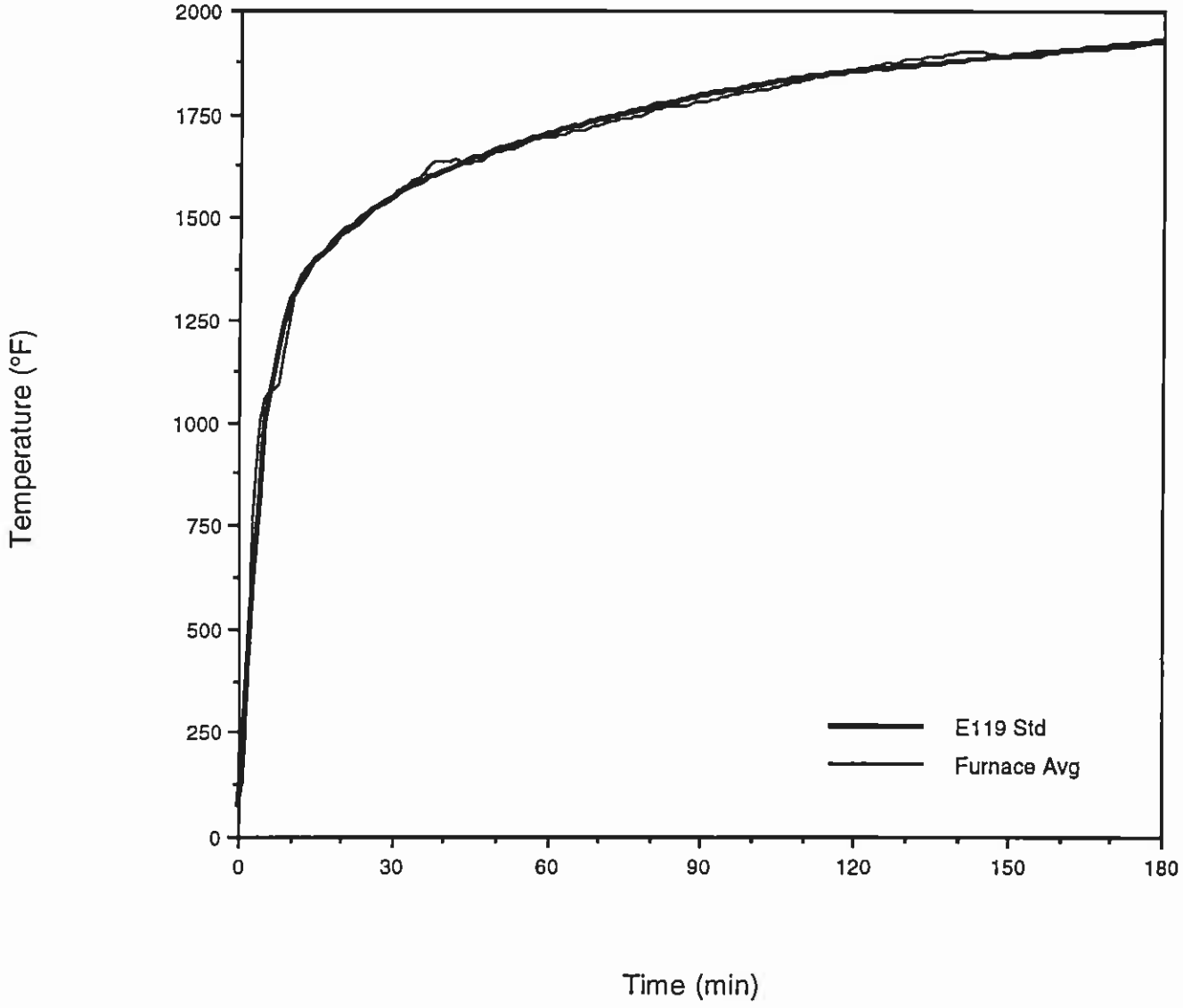
Scale: 3/4"=1'

Appendix D

TEST DATA

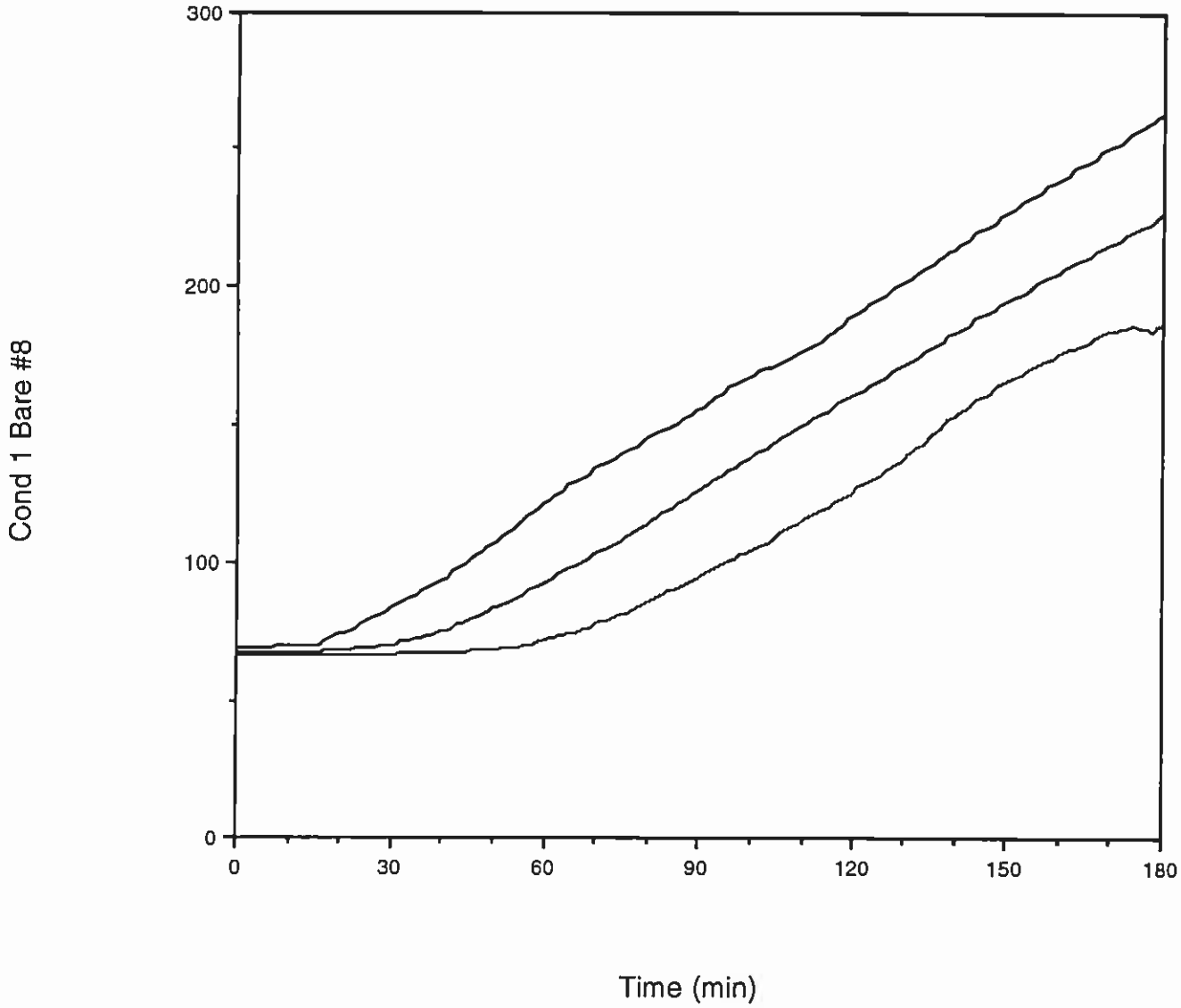
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Furnace Interior Temperature



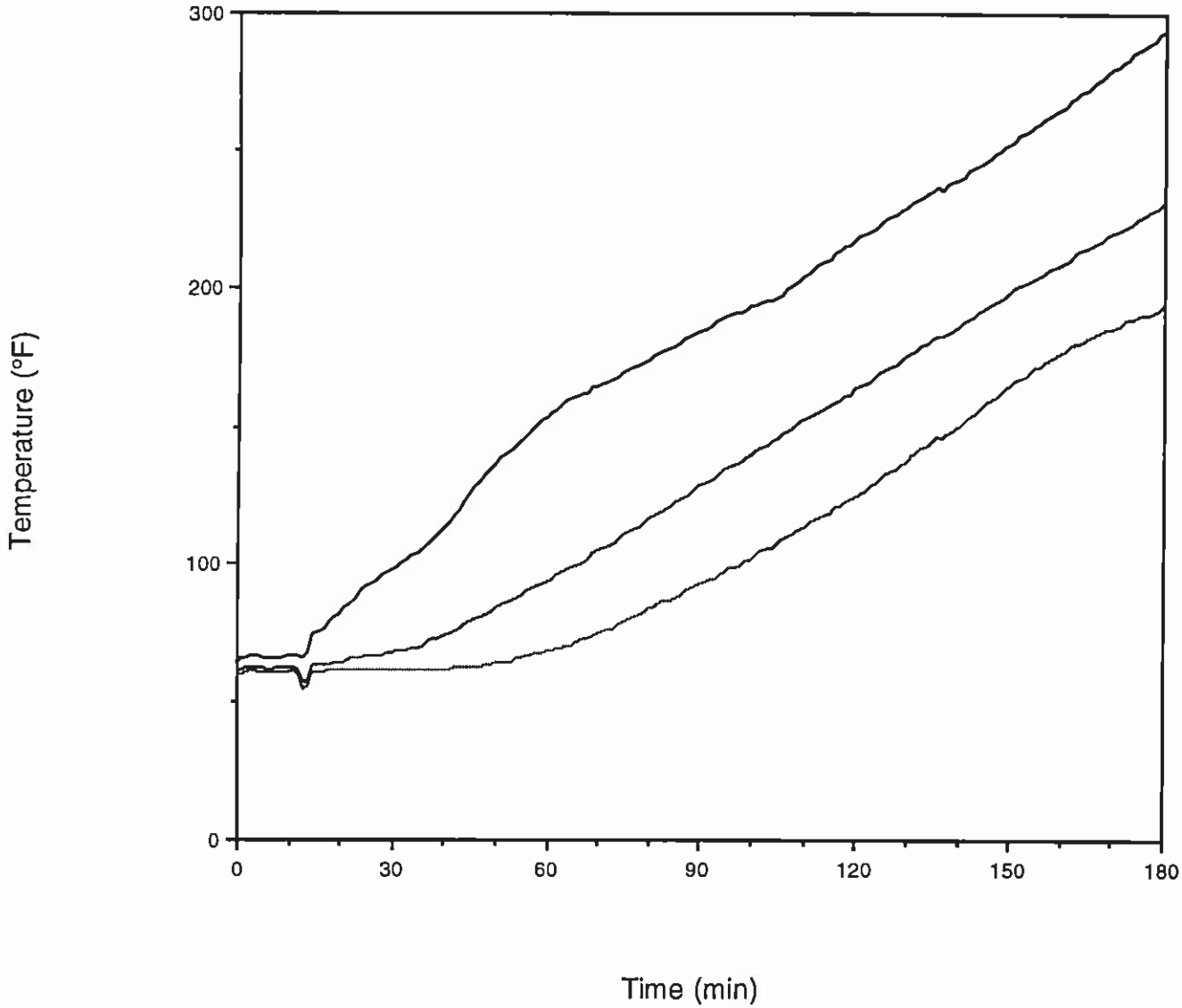
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #1 Bare #8 AWG Max, Avg & Min Temperatures



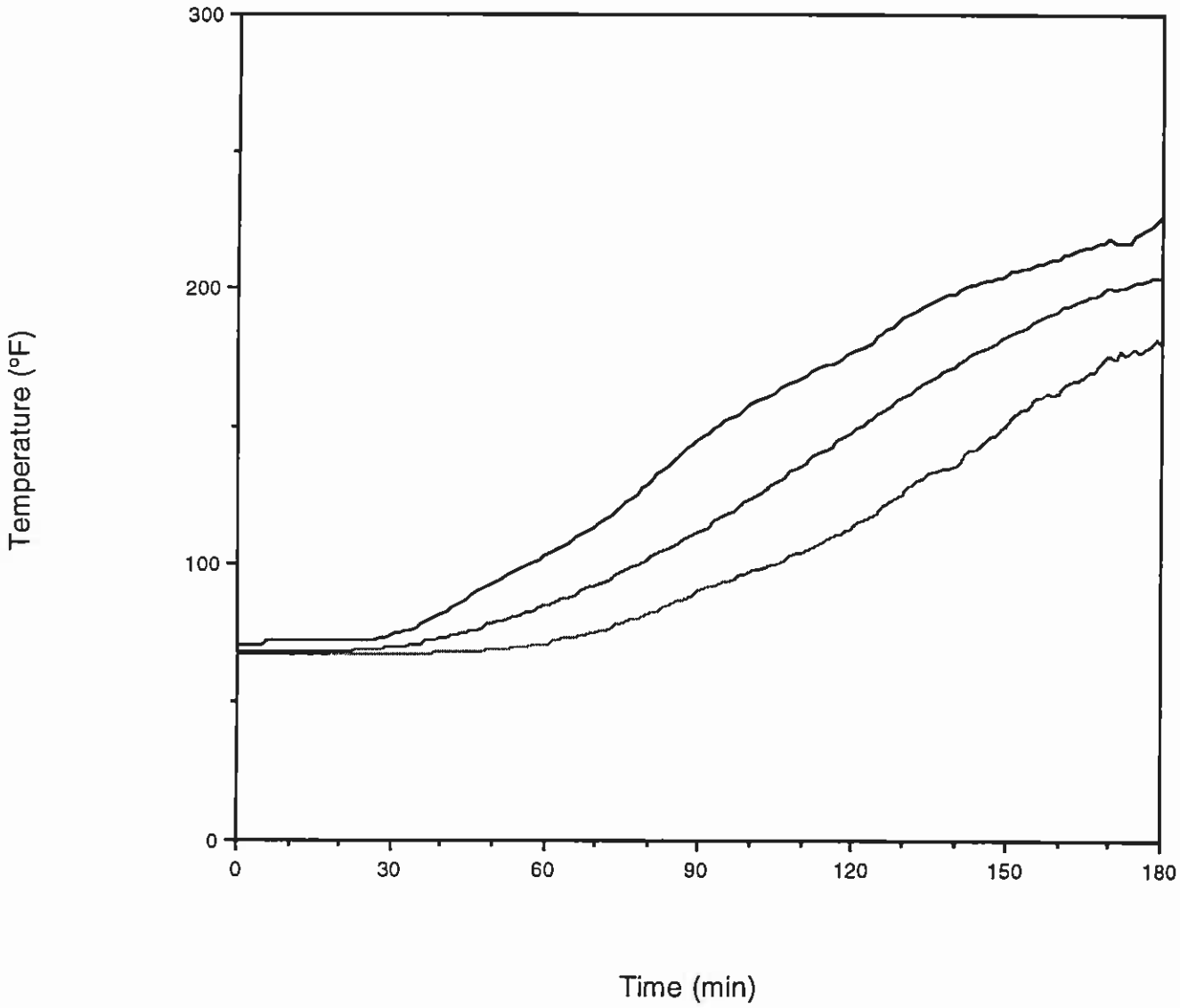
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #1 Surface Max, Avg & Min Temperatures



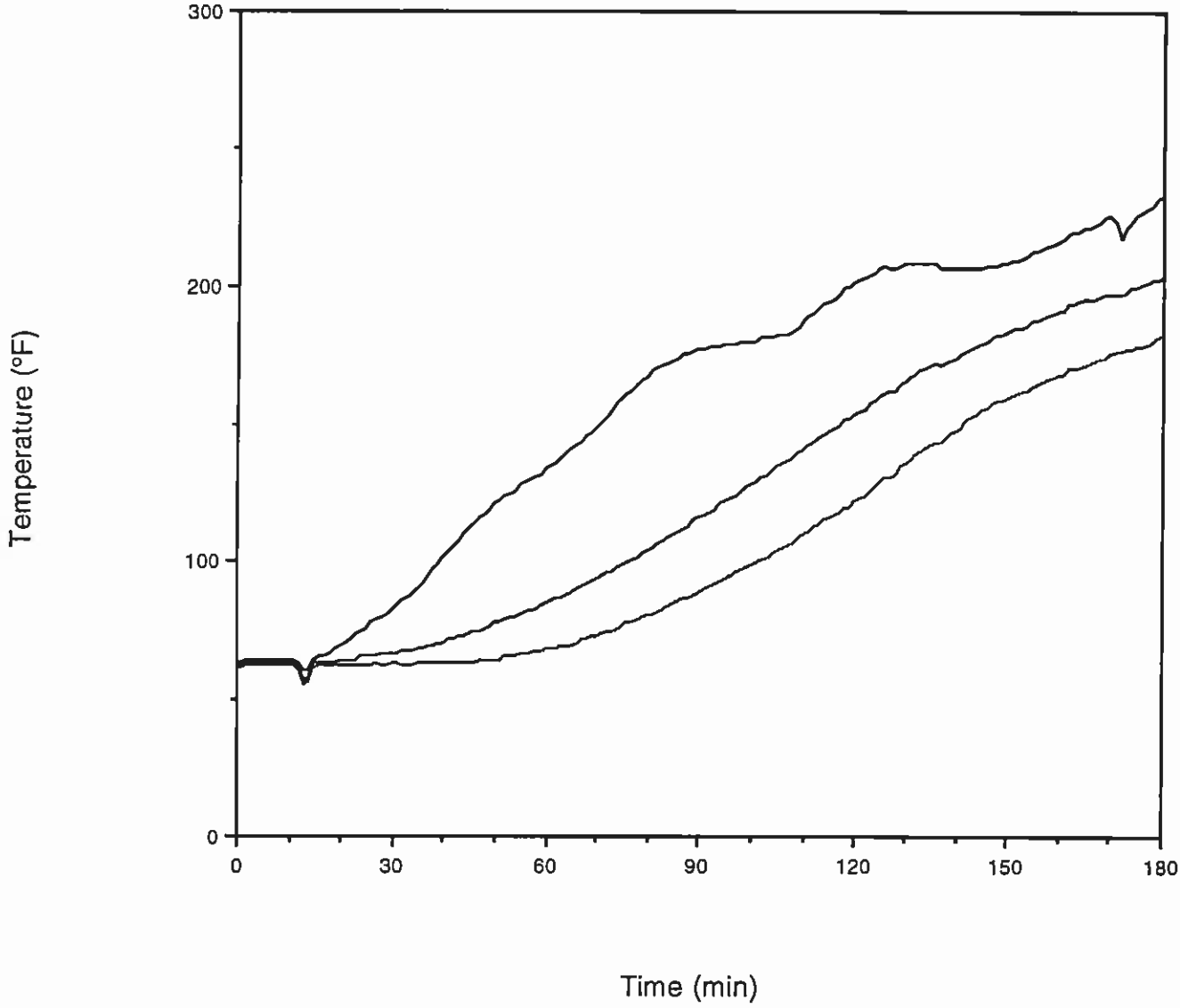
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #2 Bare #8 AWG Max, Avg & Min Temperatures



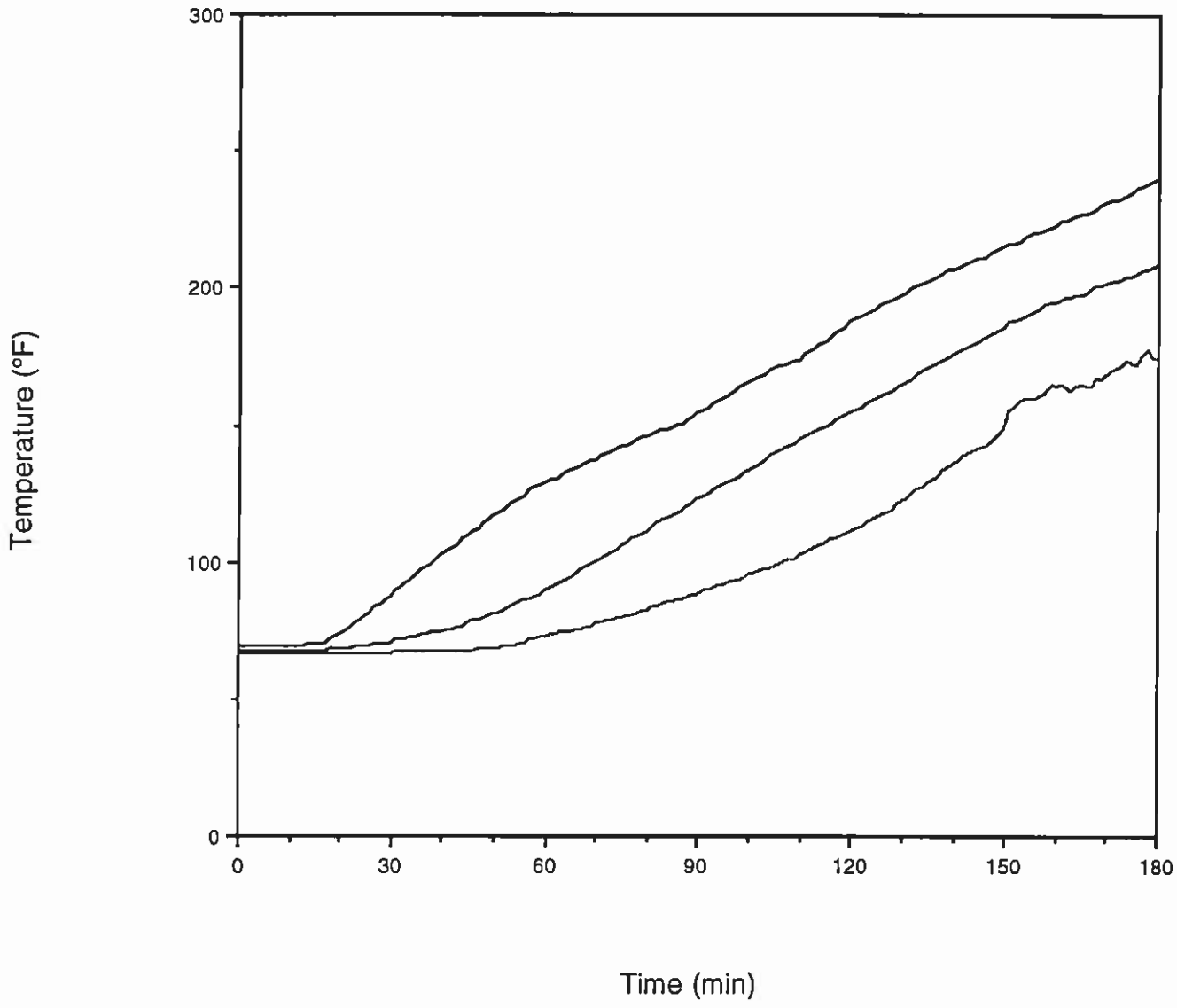
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #2 Surface Max, Avg & Min Temperatures



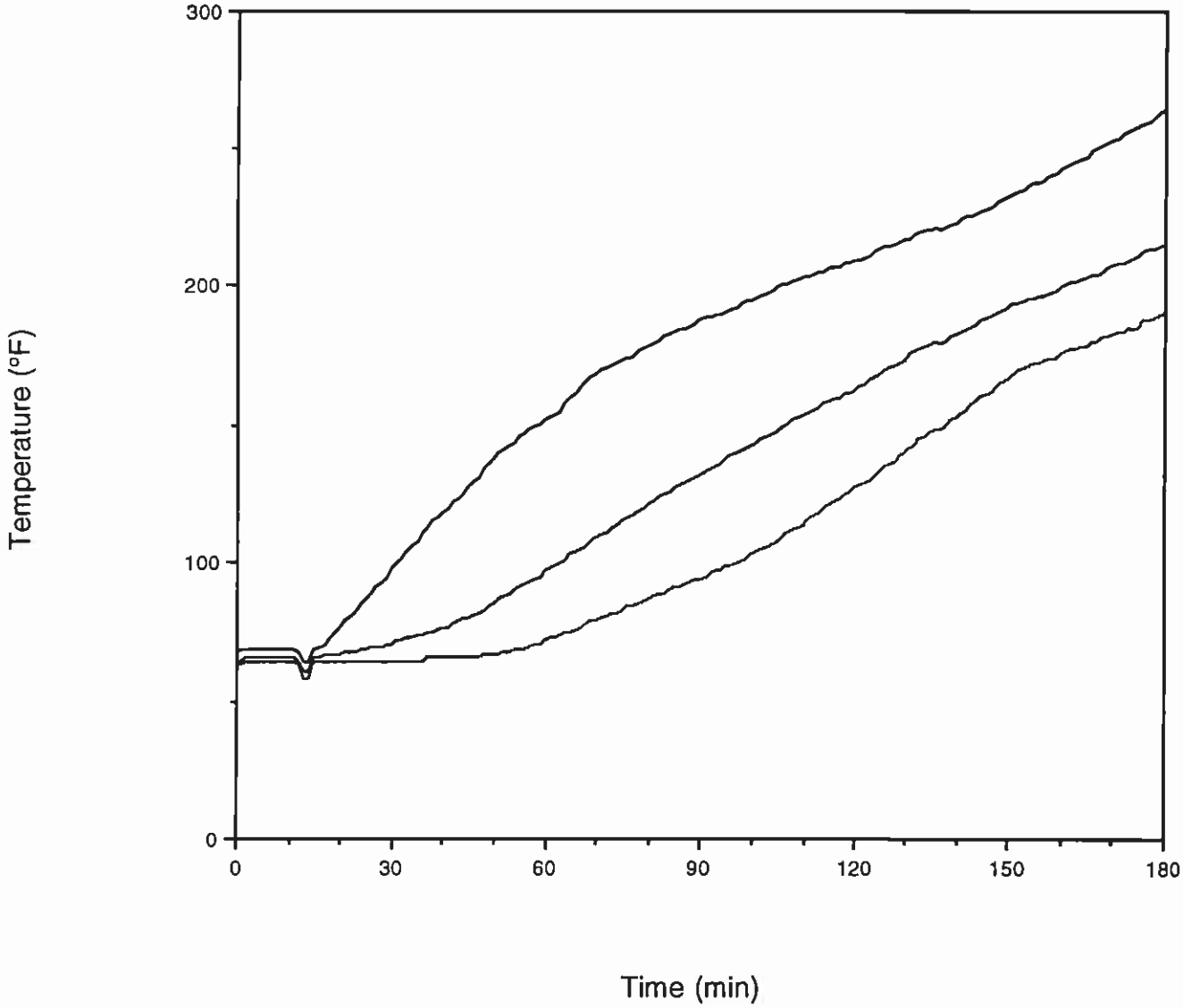
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #3 Bare #8 AWG Max, Avg & Min Temperatures



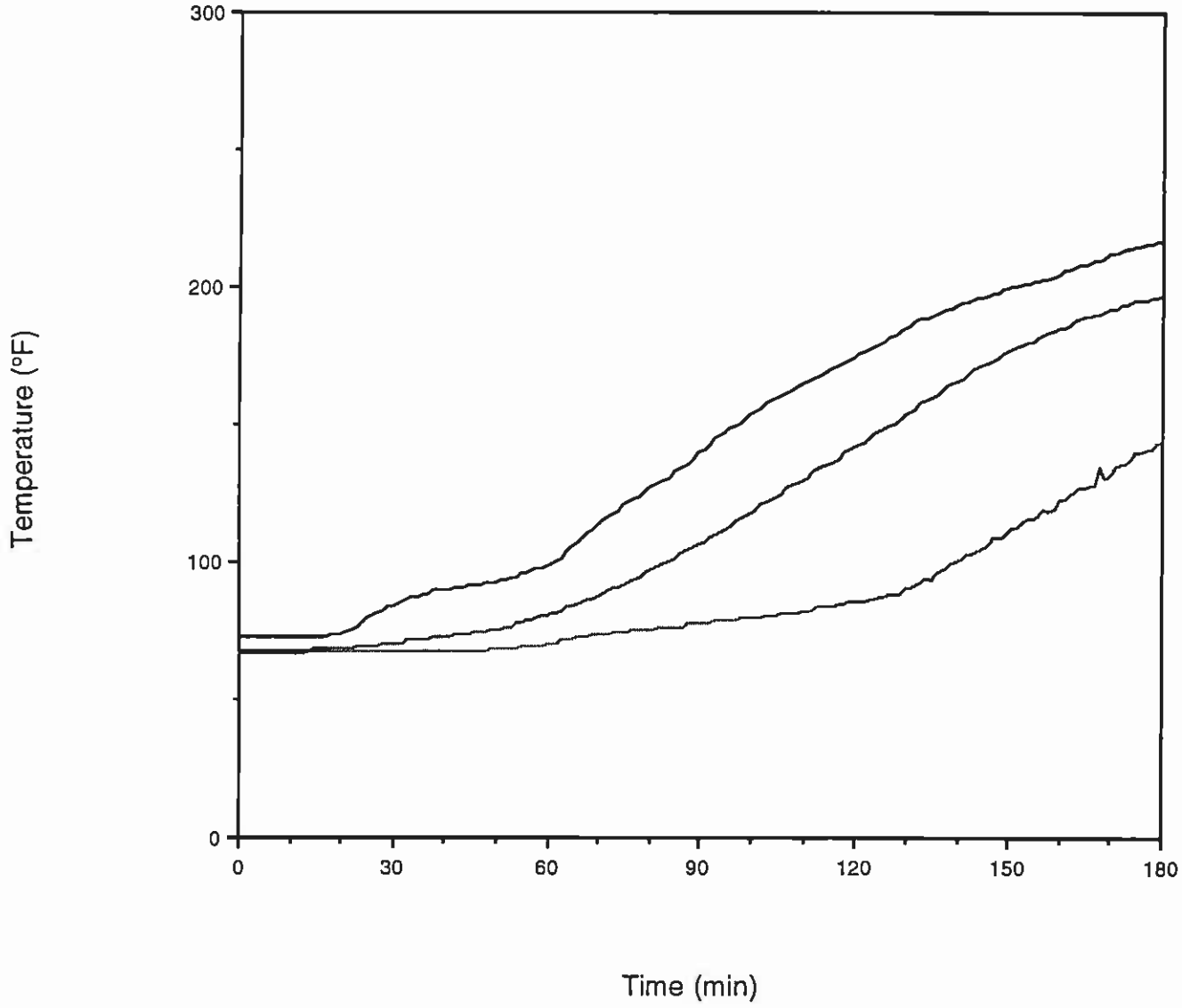
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #3 Surface Max, Avg & Min Temperatures



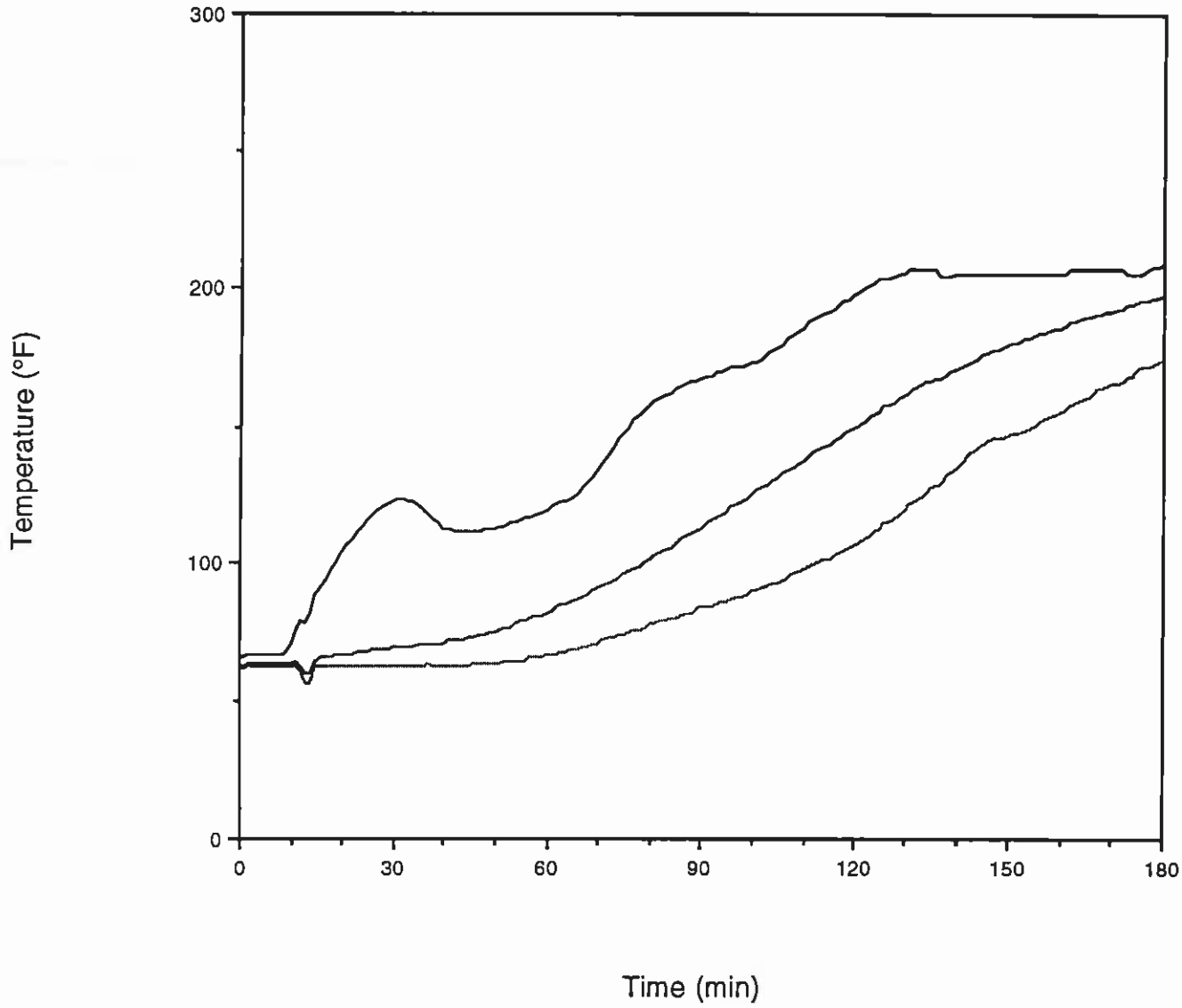
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #4 Bare #8 AWG Max, Avg & Min Temperatures



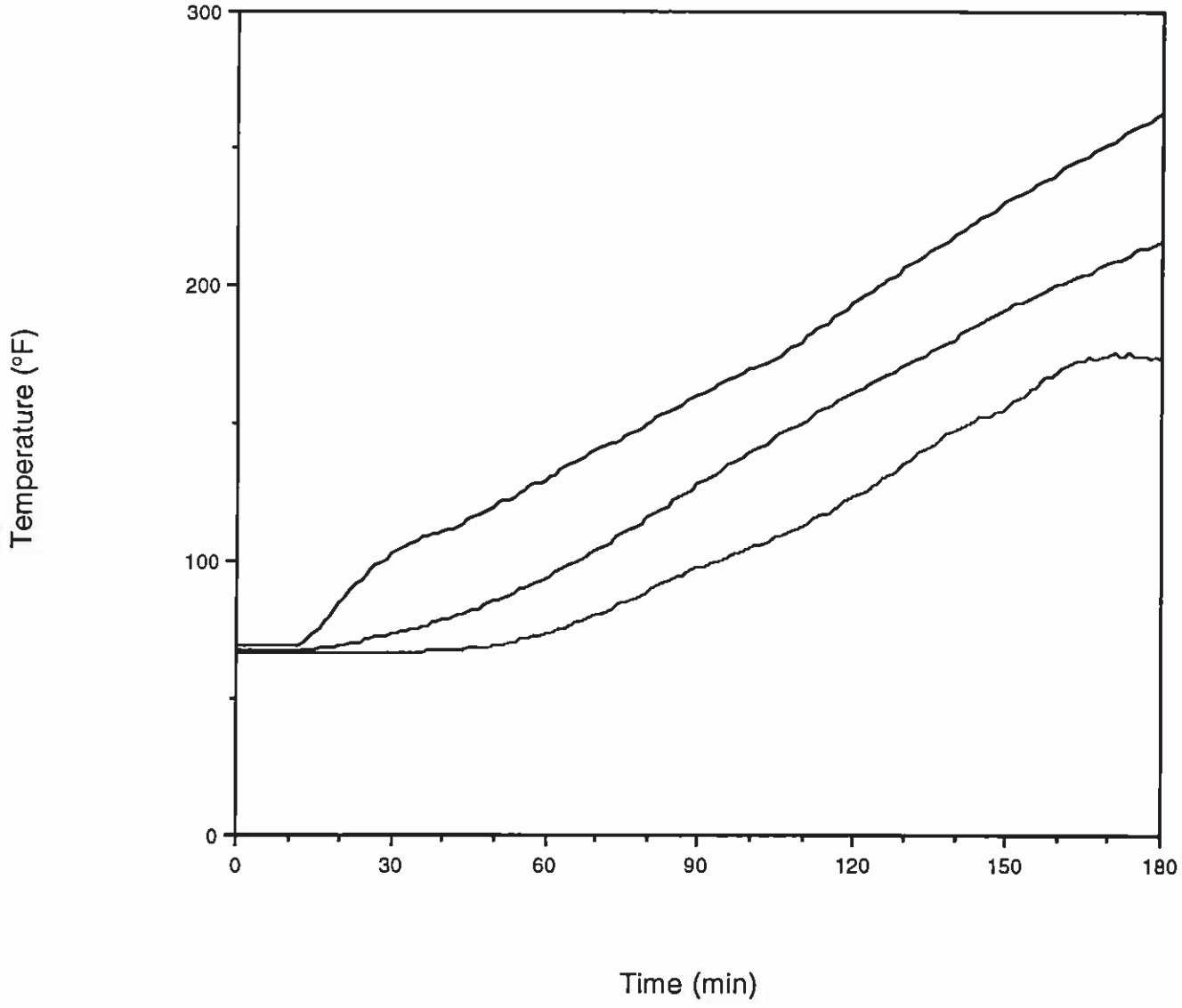
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #4 Surface Max, Avg & Min Temperatures



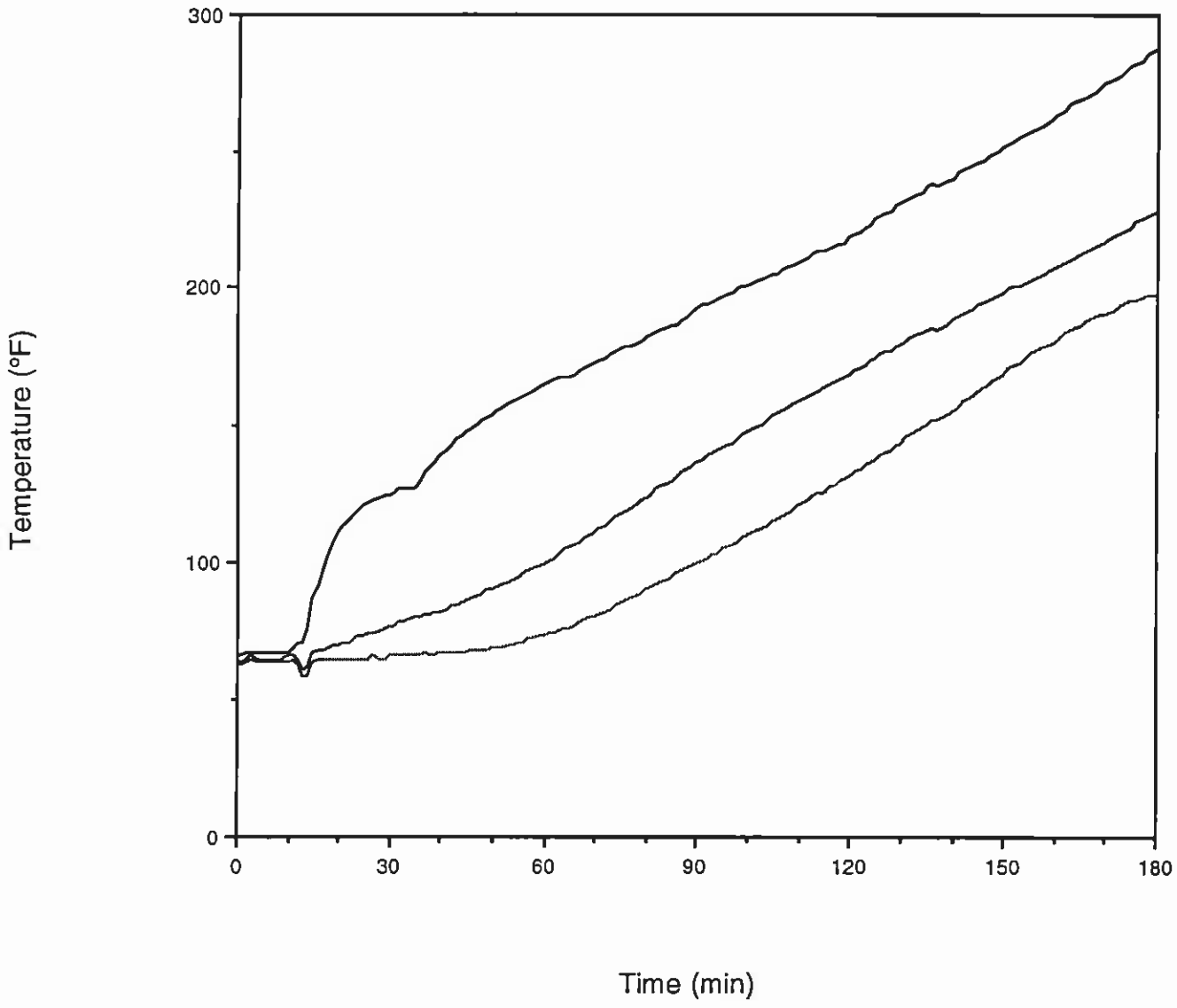
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #5 Bare #8 AWG Max, Avg & Min Temperatures



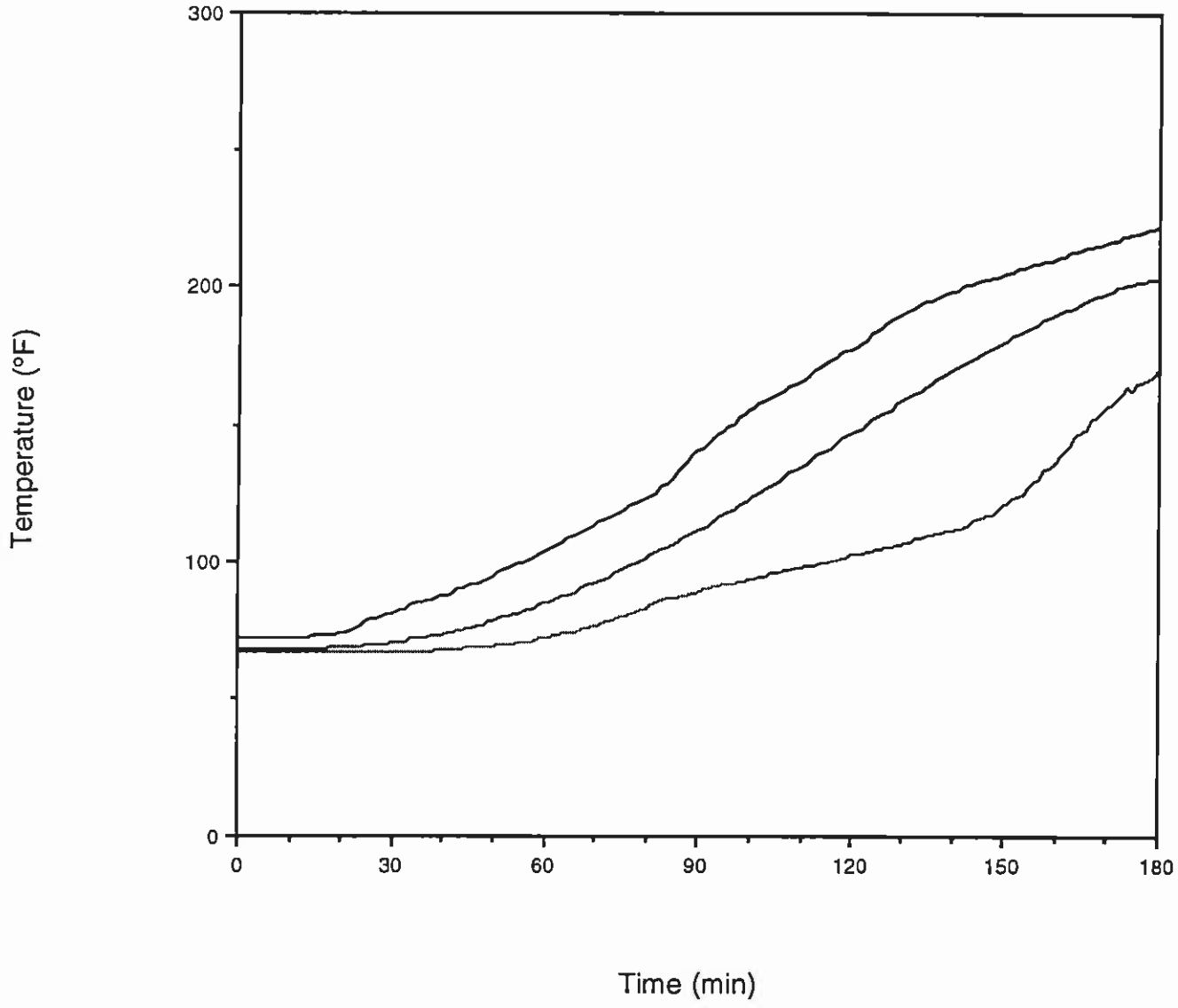
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #5 Surface Max, Avg & Min Temperatures



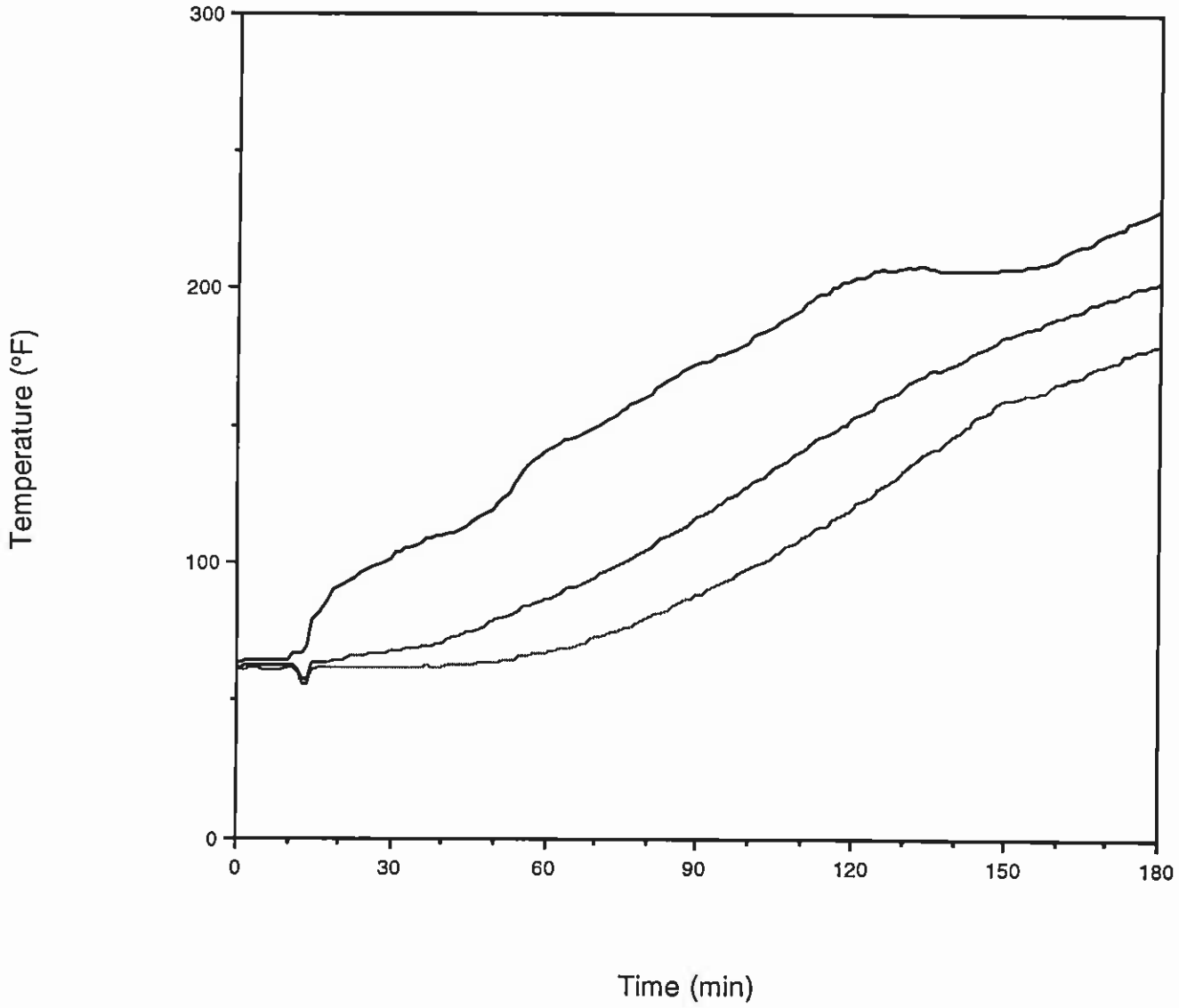
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #6 Bare #8 AWG Max, Avg & Min Temperatures



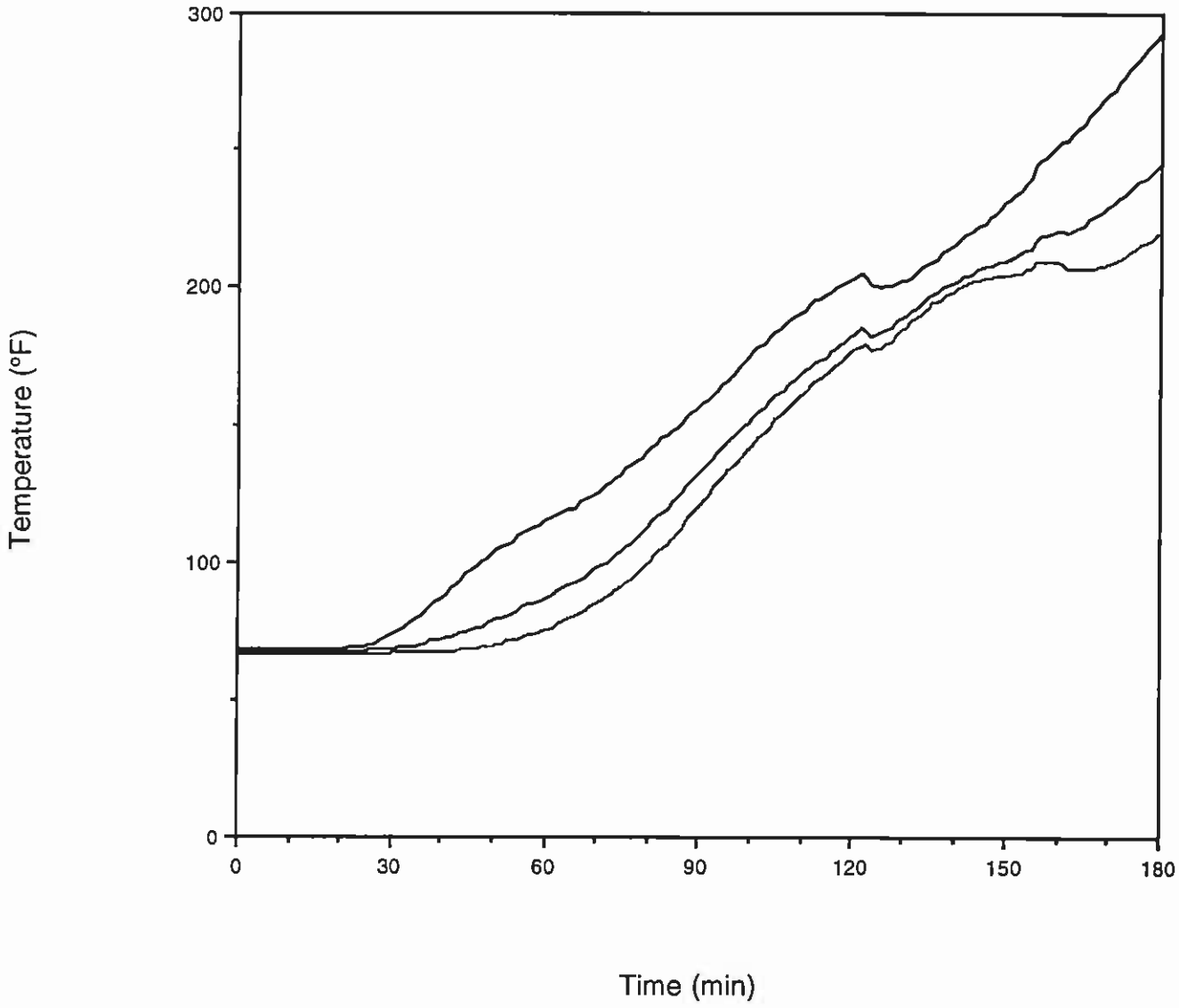
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #6 Surface Max, Avg & Min Temperatures



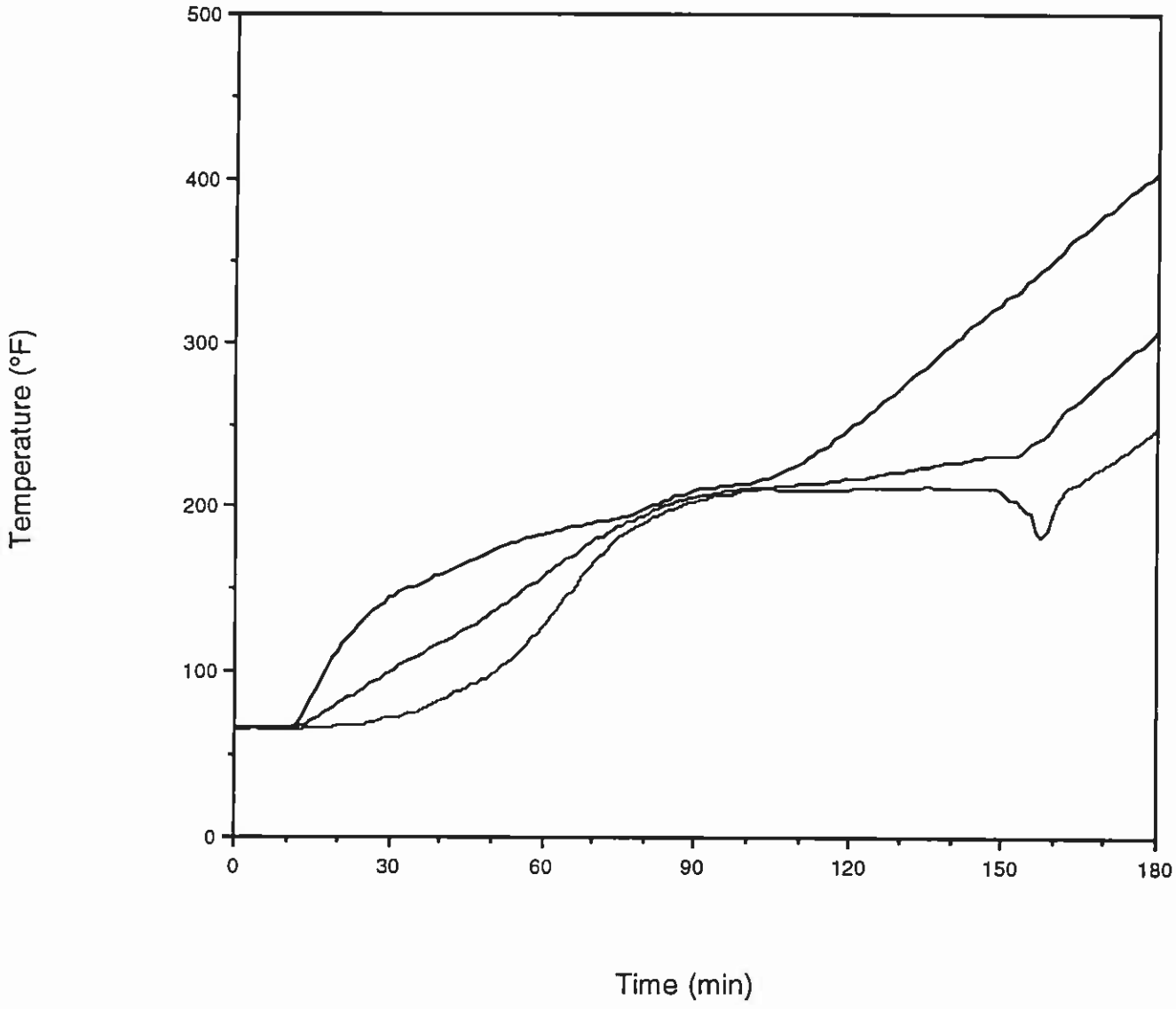
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #9 Surface Max, Avg & Min Temperatures



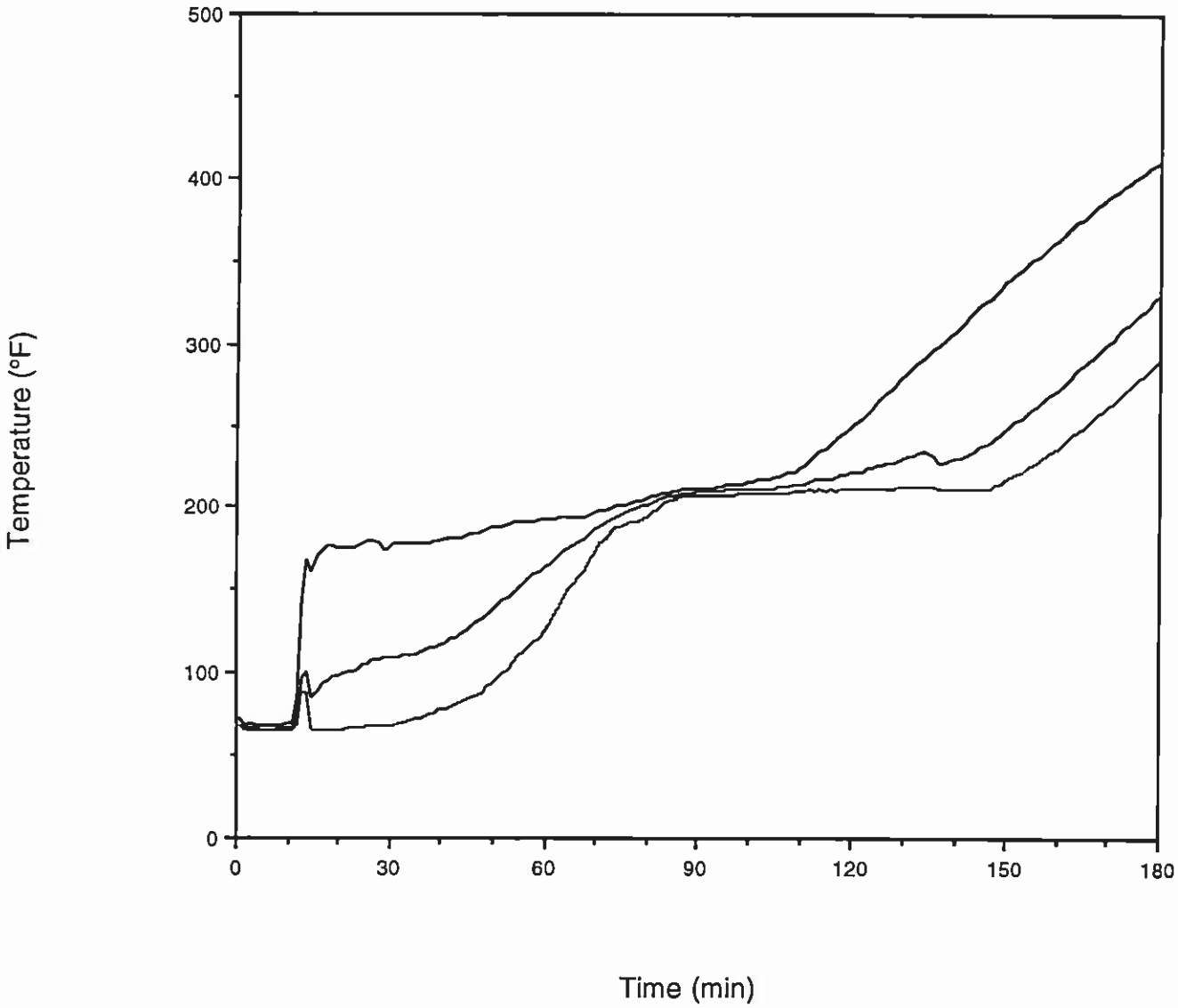
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #10 Bare #8 AWG Max, Avg & Min Temperatures



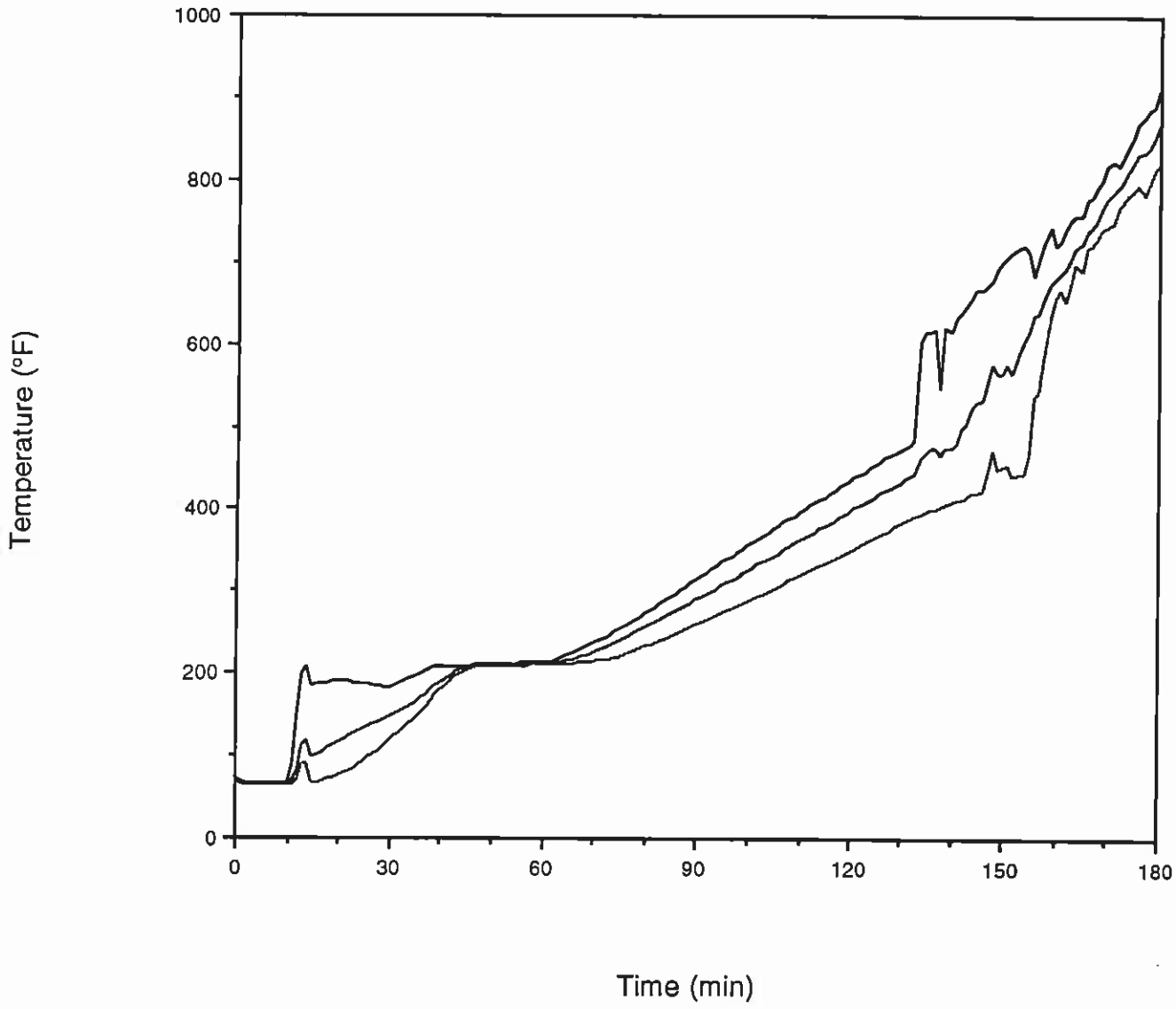
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #10 Surface Max, Avg & Min Temperatures



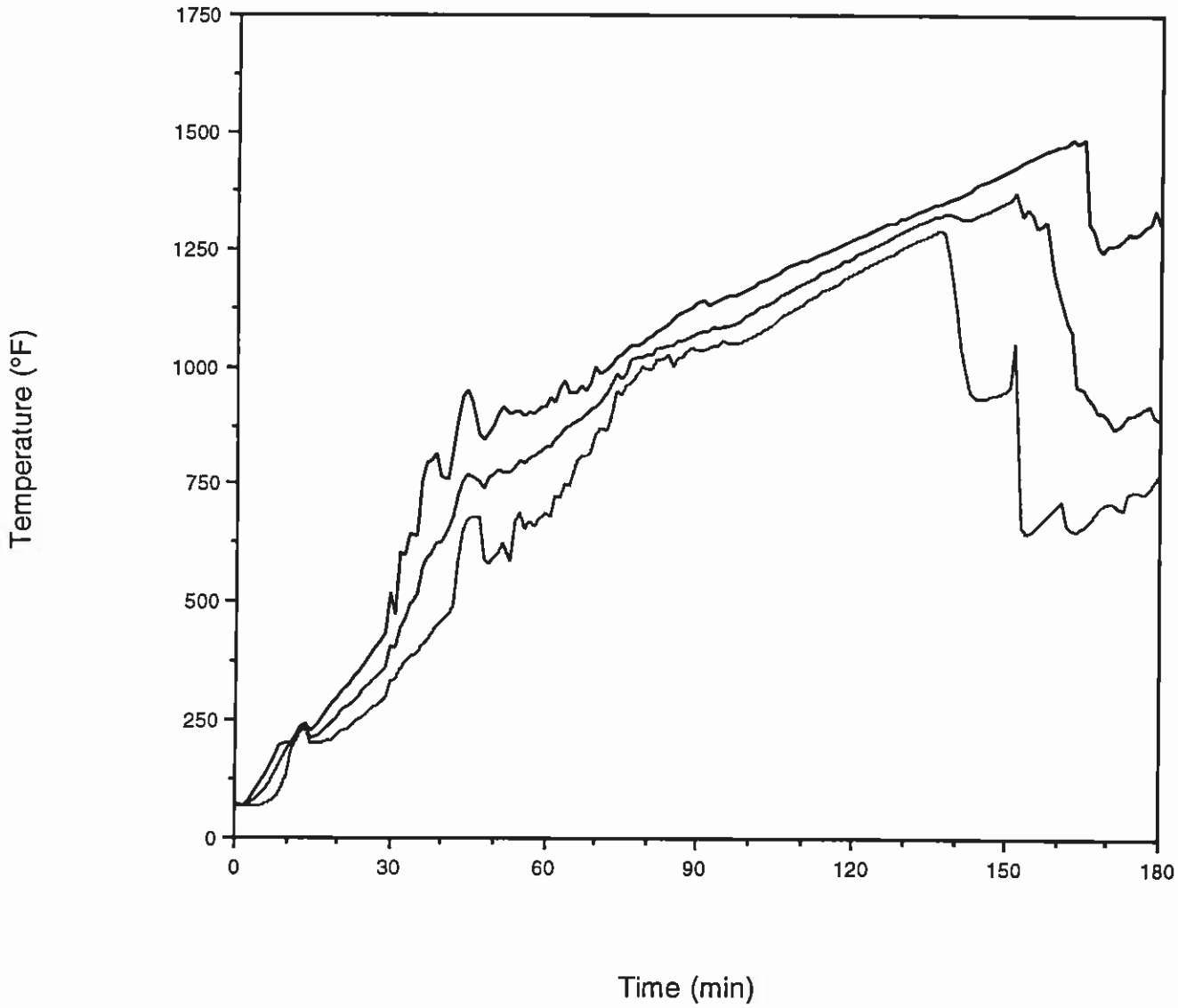
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #11 Surface Max, Avg & Min Temperatures



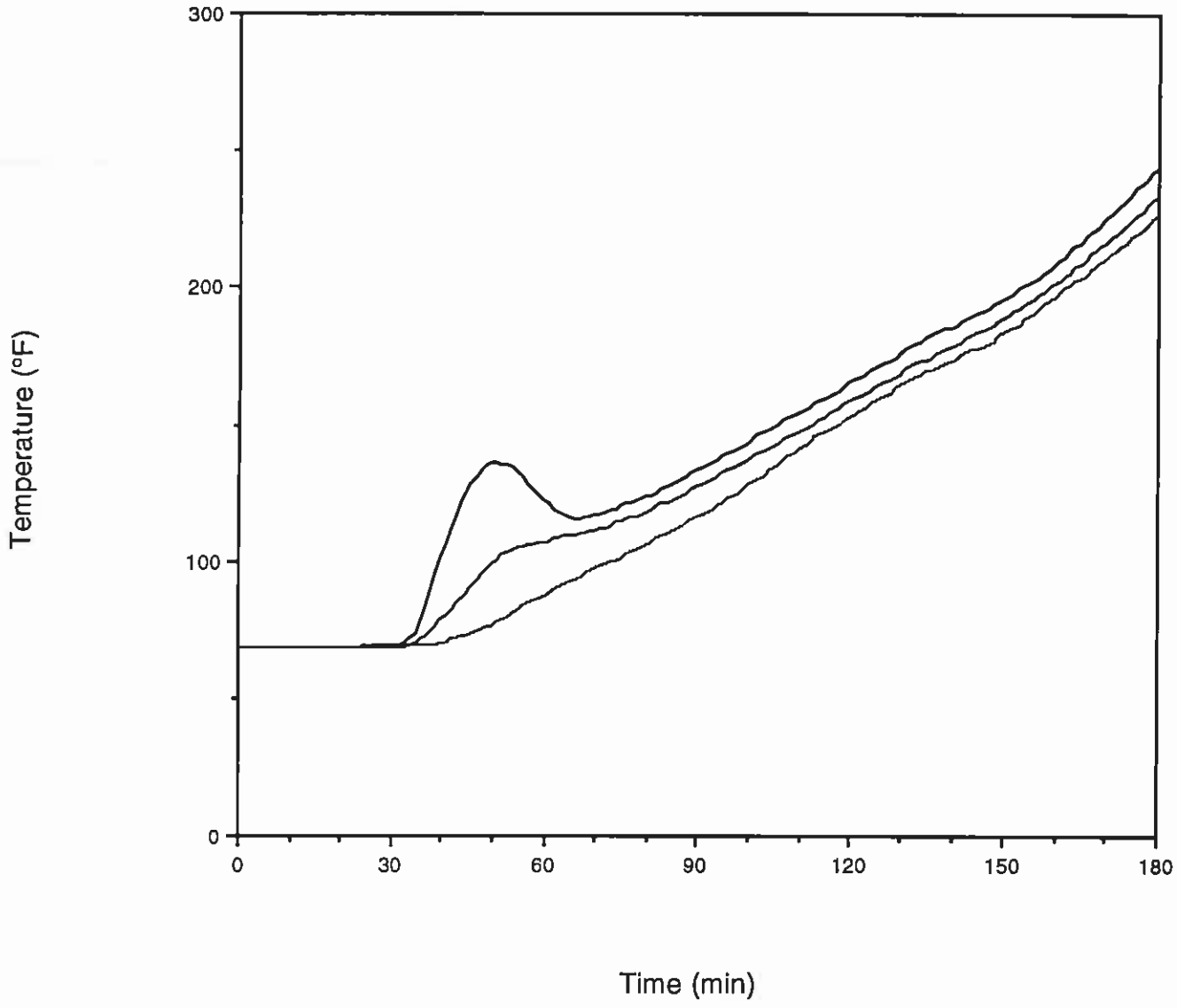
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Conduit #12 Surface Max, Avg & Min Temperatures



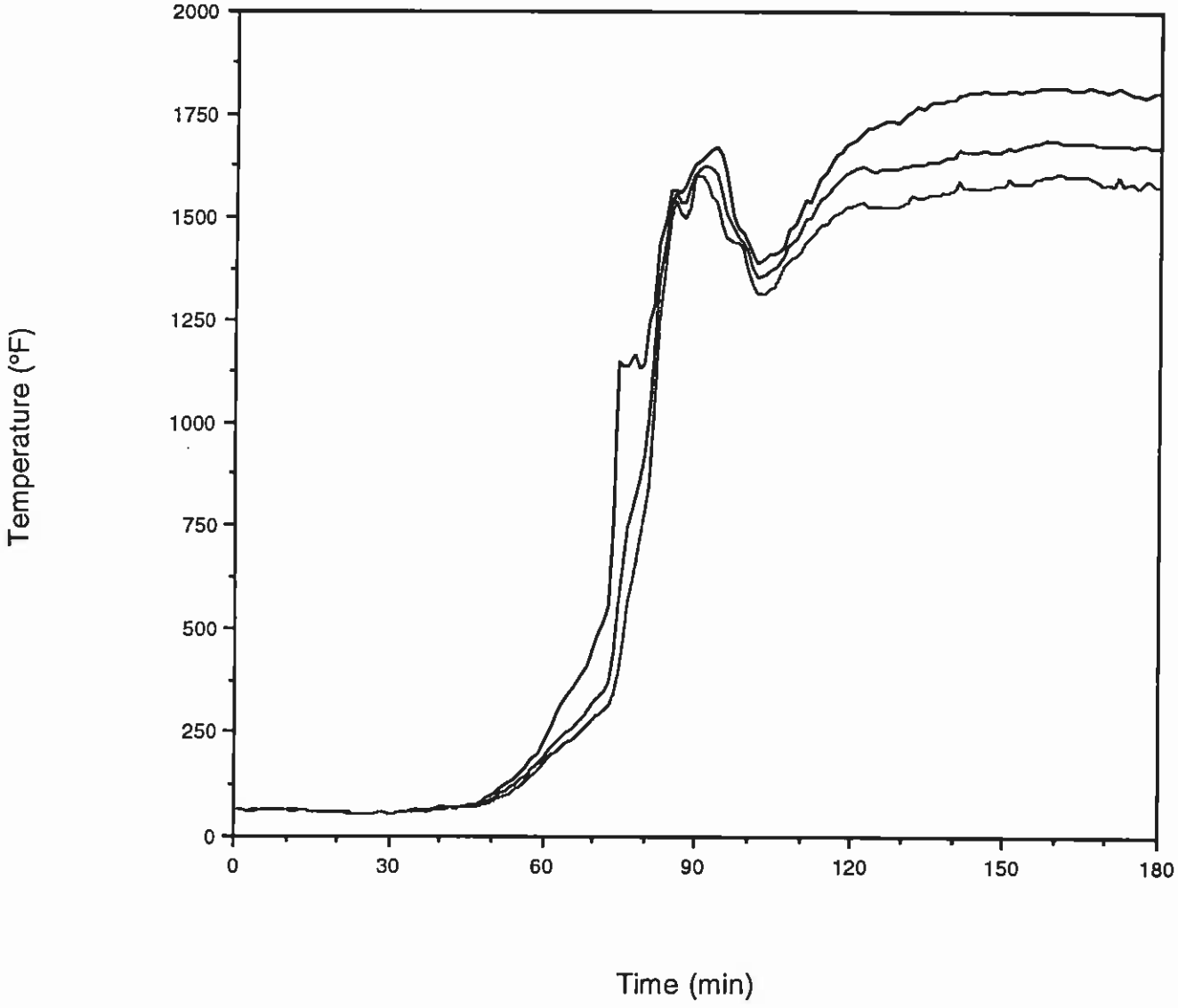
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Junction Box #1 Max, Avg & Min Temperatures



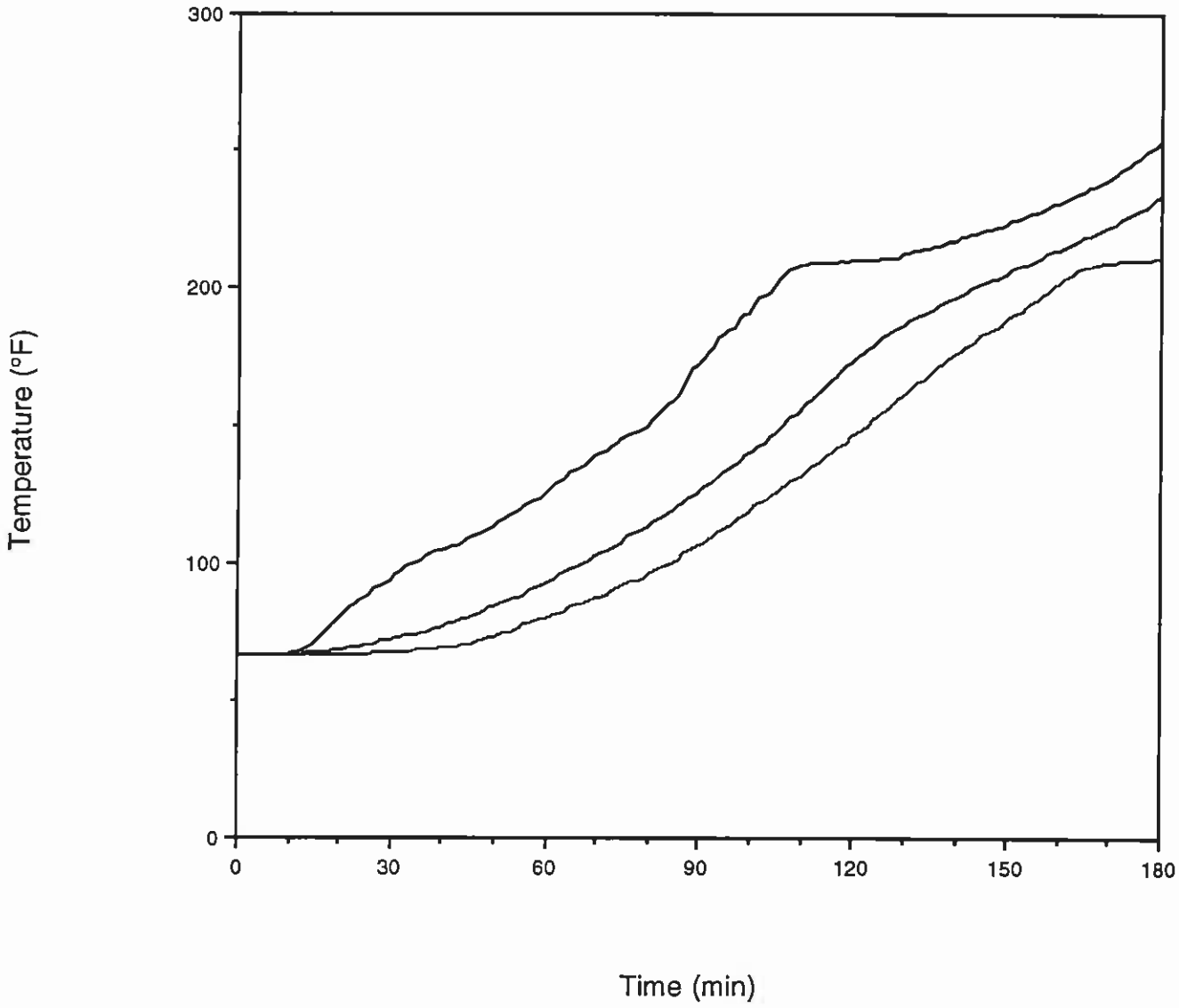
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Junction Box #2 Max, Avg & Min Temperatures



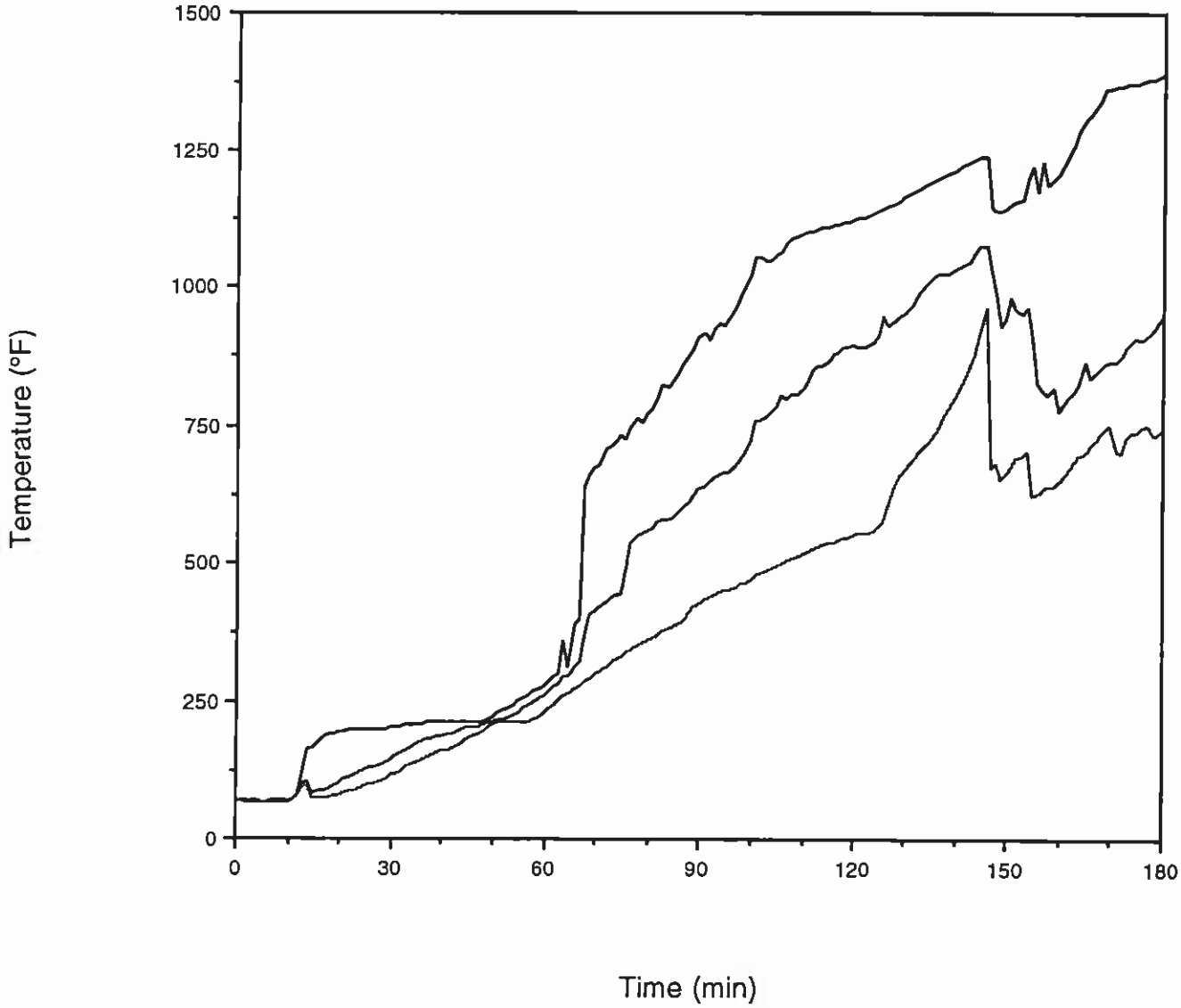
OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Junction Box #3 Max, Avg & Min Temperatures



OMEGA POINT LABORATORIES

Project No. 8610-102570
PCI/Promatec
Trapeze AWG Max, Avg & Min Temperatures



OMEGA POINT LABORATORIES

Pages 114 to 122
Intentionally Left Out

Time (min)	Conduit #2 Bare #8 TC No. 1 (°F)	Conduit #2 Bare #8 TC No. 2 (°F)	Conduit #2 Bare #8 TC No. 3 (°F)	Conduit #2 Bare #8 TC No. 4 (°F)	Conduit #2 Bare #8 TC No. 5 (°F)	Conduit #2 Bare #8 TC No. 6 (°F)	Conduit #2 Bare #8 TC No. 7 (°F)	Conduit #2 Bare #8 TC No. 8 (°F)
0	70	70	69	68	67	67	67	67
1	70	70	69	68	67	67	67	67
2	70	70	69	68	67	67	67	67
3	70	70	69	68	67	67	67	67
4	70	70	69	68	67	67	67	67
5	70	70	69	68	67	67	67	67
6	71	70	69	68	67	67	67	67
7	71	70	69	68	68	67	67	67
8	71	70	69	68	68	67	67	67
9	71	70	69	68	67	67	67	67
10	71	70	69	68	68	67	67	67
11	71	70	69	68	68	67	67	67
12	71	70	69	68	68	67	67	67
13	71	70	69	68	68	67	67	67
14	71	70	69	68	68	67	67	67
15	71	70	69	68	68	67	67	67
16	71	70	69	68	68	67	67	67
17	71	70	69	68	68	67	67	67
18	71	70	69	68	68	67	67	67
19	71	70	69	68	68	67	67	67
20	71	70	69	69	68	67	67	67
21	71	70	70	69	68	67	67	67
22	71	70	70	69	68	67	67	67
23	71	70	70	69	68	67	67	67
24	71	71	70	69	68	68	67	67
25	71	71	70	70	68	68	67	67
26	71	71	71	70	69	68	67	67
27	71	71	71	70	69	68	68	67
28	72	71	72	71	69	68	68	68
29	72	72	72	71	70	68	68	68
30	72	72	73	72	70	69	68	68
31	72	72	73	72	70	69	68	68
32	73	73	74	73	71	69	68	69
33	73	73	75	74	71	69	69	69
34	73	74	75	75	72	70	69	69
35	74	74	76	75	72	70	69	70
36	74	75	77	76	73	71	70	70
37	75	76	78	77	74	71	70	70
38	75	76	79	78	74	71	70	71
39	76	77	80	79	75	72	71	71
40	76	77	81	80	76	73	71	72
41	77	78	82	81	77	73	72	72
42	77	79	83	82	77	74	72	72
43	78	80	84	83	78	74	73	73
44	78	80	85	85	79	75	73	73
45	79	81	86	86	80	76	74	74
46	79	82	88	87	81	77	75	75

OMEGA POINT LABORATORIES

Time (min)	Conduit #2 Bare #8 TC No. 1 (°F)	Conduit #2 Bare #8 TC No. 2 (°F)	Conduit #2 Bare #8 TC No. 3 (°F)	Conduit #2 Bare #8 TC No. 4 (°F)	Conduit #2 Bare #8 TC No. 5 (°F)	Conduit #2 Bare #8 TC No. 6 (°F)	Conduit #2 Bare #8 TC No. 7 (°F)	Conduit #2 Bare #8 TC No. 8 (°F)
47	80	83	89	88	82	77	75	75
48	81	83	90	89	83	78	76	76
49	81	84	91	90	84	79	76	76
50	82	85	92	92	85	80	77	77
51	82	86	93	93	86	81	78	78
52	83	86	94	94	87	81	79	78
53	84	87	95	95	88	82	79	79
54	84	88	96	96	89	83	80	80
55	85	89	97	97	90	84	81	80
56	85	89	98	98	91	85	82	81
57	86	90	99	99	92	86	83	82
58	86	91	100	100	93	87	83	83
59	87	91	101	101	94	88	84	84
60	87	92	102	102	95	89	85	84
61	88	93	102	103	96	90	86	85
62	89	93	103	104	97	91	87	86
63	89	94	104	105	98	92	88	87
64	90	95	105	106	99	93	89	88
65	90	95	106	107	101	94	90	89
66	91	96	107	109	102	94	90	90
67	92	97	108	110	103	96	91	90
68	92	98	109	111	104	97	92	91
69	93	98	110	112	105	98	93	92
70	93	99	111	113	106	99	94	93
71	94	100	112	114	107	100	95	94
72	94	101	113	116	109	101	96	95
73	95	101	114	117	110	102	97	96
74	96	102	116	119	112	103	98	97
75	96	103	117	120	113	105	100	98
76	97	104	118	122	115	106	101	99
77	98	105	119	123	116	107	102	100
78	98	106	120	125	118	109	103	101
79	99	106	122	127	120	110	104	102
80	100	107	123	128	122	112	105	104
81	100	108	124	130	123	113	107	105
82	101	109	126	132	125	115	108	106
83	102	110	127	133	127	117	109	107
84	103	111	128	135	129	119	111	108
85	103	111	129	137	131	121	112	109
86	104	112	130	138	133	123	114	111
87	104	113	131	140	135	125	116	112
88	105	114	132	142	137	127	117	113
89	106	115	133	143	139	129	119	115
90	106	115	135	144	141	132	121	116
91	107	116	136	146	143	134	123	118
92	108	117	137	147	145	136	126	119
93	108	118	138	149	147	138	128	121

OMEGA POINT LABORATORIES

PCI/Promatec Project No. 8610-102570 March 19, 1998

Time (min)	Conduit #2 Bare #8 TC No. 1 (°F)	Conduit #2 Bare #8 TC No. 2 (°F)	Conduit #2 Bare #8 TC No. 3 (°F)	Conduit #2 Bare #8 TC No. 4 (°F)	Conduit #2 Bare #8 TC No. 5 (°F)	Conduit #2 Bare #8 TC No. 6 (°F)	Conduit #2 Bare #8 TC No. 7 (°F)	Conduit #2 Bare #8 TC No. 8 (°F)
94	109	118	139	150	148	141	130	123
95	109	119	140	151	150	143	132	125
96	110	120	140	152	151	145	135	127
97	111	121	141	153	153	147	137	129
98	111	121	142	154	154	149	139	131
99	112	122	143	155	156	151	142	133
100	112	122	144	156	157	153	144	135
101	113	123	144	157	158	154	146	137
102	113	124	145	157	159	156	149	140
103	114	124	145	158	160	157	151	142
104	115	125	146	159	161	159	153	145
105	115	126	147	159	162	160	155	147
106	116	126	147	160	163	162	157	149
107	116	127	148	161	164	163	158	151
108	117	127	149	162	165	164	160	154
109	117	128	149	162	166	165	162	156
110	118	129	150	163	167	167	163	158
111	119	129	151	164	167	168	165	160
112	119	130	151	164	168	169	166	162
113	120	130	152	165	169	170	167	163
114	120	131	152	166	170	171	169	165
115	121	132	153	166	171	172	170	167
116	121	132	153	167	171	172	171	168
117	122	132	154	168	172	173	172	170
118	122	133	155	168	173	174	173	171
119	123	134	155	169	174	175	174	172
120	123	134	156	170	174	176	175	174
121	124	135	157	170	175	177	176	175
122	124	136	158	171	176	178	177	176
123	125	136	158	172	177	179	178	177
124	126	137	159	172	177	179	179	178
125	126	138	160	173	178	180	180	180
126	127	138	160	174	179	181	181	181
127	127	139	161	174	179	182	182	182
128	128	140	161	175	180	182	183	183
129	129	140	162	175	181	183	184	184
130	129	141	163	176	181	184	185	185
131	130	142	163	177	182	185	185	186
132	130	142	164	177	183	185	186	187
133	131	143	165	178	183	186	187	187
134	132	143	165	178	184	187	188	188
135	132	144	166	179	185	188	189	189
136	133	144	167	180	185	189	189	190
137	133	145	167	180	186	189	190	191
138	134	145	168	181	187	190	191	192
139	134	146	168	182	188	191	192	193
140	135	146	168	182	188	191	193	193

OMEGA POINT LABORATORIES

Time (min)	Conduit #2 Bare #8 TC No. 1 (°F)	Conduit #2 Bare #8 TC No. 2 (°F)	Conduit #2 Bare #8 TC No. 3 (°F)	Conduit #2 Bare #8 TC No. 4 (°F)	Conduit #2 Bare #8 TC No. 5 (°F)	Conduit #2 Bare #8 TC No. 6 (°F)	Conduit #2 Bare #8 TC No. 7 (°F)	Conduit #2 Bare #8 TC No. 8 (°F)
141	**136**	147	169	183	189	192	193	194
142	**139**	148	169	183	189	193	194	195
143	**141**	149	169	183	190	193	195	196
144	**141**	149	170	184	190	194	195	196
145	**142**	151	171	184	191	195	196	197
146	**144**	152	171	185	191	195	197	198
147	**146**	153	172	185	192	196	197	198
148	**146**	155	173	186	193	196	198	199
149	**149**	156	174	186	193	197	198	199
150	**150**	157	175	187	193	197	199	200
151	**153**	160	176	187	194	198	199	201
152	**156**	163	178	188	194	198	200	201
153	**156**	163	179	188	194	199	200	202
154	**159**	163	179	188	194	199	201	202
155	**159**	165	181	188	195	199	201	203
156	**163**	167	182	189	195	200	202	203
157	**164**	169	182	189	195	200	202	204
158	**165**	172	182	190	195	200	203	204
159	**166**	170	184	190	196	200	203	205
160	**169**	172	184	191	196	201	204	205
161	**168**	173	184	191	196	201	204	206
162	**169**	174	186	192	196	201	205	207
163	**171**	175	186	191	197	202	205	207
164	**172**	175	186	192	197	202	206	208
165	**173**	177	185	193	198	202	206	208
166	**173**	178	186	193	198	203	207	209
167	**176**	179	187	193	198	203	207	209
168	**177**	181	187	195	199	203	207	210
169	**178**	180	189	195	199	204	208	210
170	**180**	181	191	195	199	204	208	210
171	**179**	181	191	194	200	204	208	210
172	**181**	183	191	197	200	204	208	211
173	**181**	183	191	196	200	205	209	211
174	**181**	182	193	198	201	205	209	211
175	**183**	188	194	197	201	205	209	211
176	**184**	186	192	198	201	206	209	211
177	**183**	185	192	198	201	206	209	211
178	**185**	187	194	198	200	205	210	212
179	**186**	187	194	196	200	203	210	212
180	**185**	187	196	200	201	203	209	212

Time (min)	Conduit #2 Bare #8 TC No. 9 (°F)	Conduit #2 Bare #8 TC No. 10 (°F)	Conduit #2 Bare #8 TC No. 11 (°F)	Conduit #2 Bare #8 TC No. 12 (°F)	Conduit #2 Bare #8 TC No. 13 (°F)	Conduit #2 Bare #8 TC No. 14 (°F)	Conduit #2 Bare #8 TC No. 15 (°F)	Conduit #2 Bare #8 TC No. 16 (°F)
0	67	66	66	66	66	66	66	66
1	67	66	66	66	66	66	66	66
2	66	66	66	66	66	66	66	66
3	66	66	66	66	66	66	66	66
4	67	66	66	66	66	66	66	66
5	66	66	66	66	66	66	66	66
6	67	66	66	66	66	66	66	66
7	67	66	66	66	66	66	66	66
8	67	66	66	66	66	66	66	66
9	67	66	66	66	66	66	66	66
10	67	66	66	66	66	66	66	66
11	67	66	66	66	66	66	66	66
12	67	66	66	66	66	66	66	66
13	67	66	66	66	66	66	66	66
14	67	66	66	67	66	66	66	66
15	67	66	66	67	66	66	66	66
16	67	66	67	67	67	66	66	66
17	67	67	67	67	67	66	66	66
18	67	67	67	67	67	67	67	67
19	67	67	67	68	67	67	67	67
20	67	67	67	68	67	67	67	67
21	67	67	67	68	68	67	67	67
22	67	67	68	69	68	67	67	67
23	67	67	68	69	68	67	67	67
24	67	67	68	70	69	68	68	67
25	68	68	69	70	69	68	68	68
26	68	68	69	71	69	68	68	68
27	68	68	69	71	70	69	68	68
28	68	68	70	72	70	69	68	68
29	69	69	70	72	71	69	69	69
30	69	69	71	73	71	70	69	69
31	69	69	71	74	72	70	69	69
32	70	70	72	74	72	70	70	69
33	70	70	72	75	73	71	70	70
34	70	71	73	75	73	71	70	70
35	71	71	73	76	74	71	71	70
36	71	72	74	77	74	72	71	71
37	72	72	74	77	75	72	71	72
38	72	72	75	78	75	73	72	73
39	73	73	75	78	76	73	72	74
40	73	73	76	79	76	74	73	74
41	74	74	76	80	77	74	74	76
42	74	75	77	80	78	75	75	77
43	75	75	78	81	78	75	75	78
44	75	76	78	82	79	76	76	79
45	76	76	79	82	79	77	77	80
46	76	77	79	83	80	78	78	81

OMEGA POINT LABORATORIES

Time (min)	Conduit #2 Bare #8 TC No. 9 (°F)	Conduit #2 Bare #8 TC No. 10 (°F)	Conduit #2 Bare #8 TC No. 11 (°F)	Conduit #2 Bare #8 TC No. 12 (°F)	Conduit #2 Bare #8 TC No. 13 (°F)	Conduit #2 Bare #8 TC No. 14 (°F)	Conduit #2 Bare #8 TC No. 15 (°F)	Conduit #2 Bare #8 TC No. 16 (°F)
47	77	77	80	84	81	78	78	82
48	78	78	81	84	82	79	79	83
49	78	79	81	85	82	80	80	84
50	79	79	82	86	83	80	81	86
51	79	80	83	87	84	81	82	87
52	80	81	84	88	85	82	83	88
53	81	82	84	88	85	83	84	89
54	82	82	85	89	86	84	85	90
55	82	83	86	90	87	85	86	91
56	83	84	87	91	88	85	87	93
57	84	85	88	92	89	86	88	94
58	85	85	89	93	90	87	89	95
59	86	86	89	93	90	88	90	96
60	86	87	90	94	91	89	91	97
61	87	88	91	95	92	90	92	99
62	88	89	92	96	93	91	93	100
63	89	90	93	97	94	92	94	101
64	90	91	94	98	95	93	95	102
65	91	91	95	99	96	94	96	103
66	92	92	96	100	97	95	97	104
67	93	93	97	101	98	96	98	106
68	94	94	98	102	99	97	99	107
69	95	95	98	103	100	98	100	108
70	95	96	99	104	101	99	101	109
71	96	97	100	105	102	100	102	110
72	97	98	101	106	103	101	103	111
73	98	99	102	107	104	102	104	112
74	99	100	103	108	105	103	105	113
75	100	101	104	109	106	104	106	115
76	101	102	105	110	107	105	107	116
77	102	103	107	111	108	106	108	117
78	103	104	108	112	109	107	110	118
79	104	105	109	114	110	108	111	119
80	105	106	110	115	111	109	112	120
81	107	107	111	116	113	110	113	121
82	108	108	112	117	114	112	114	122
83	109	109	113	118	115	113	115	123
84	110	110	114	119	116	114	116	124
85	111	112	115	120	117	115	117	126
86	112	113	116	122	118	116	118	127
87	113	114	118	123	120	117	120	128
88	114	115	119	124	121	118	121	129
89	116	116	120	125	122	120	122	130
90	117	117	121	127	123	121	123	131
91	118	119	123	128	124	122	124	132
92	120	120	124	129	126	123	125	134
93	121	121	125	131	127	124	127	135

OMEGA POINT LABORATORIES

Time (min)	Conduit #2 Bare #8 TC No. 9 (°F)	Conduit #2 Bare #8 TC No. 10 (°F)	Conduit #2 Bare #8 TC No. 11 (°F)	Conduit #2 Bare #8 TC No. 12 (°F)	Conduit #2 Bare #8 TC No. 13 (°F)	Conduit #2 Bare #8 TC No. 14 (°F)	Conduit #2 Bare #8 TC No. 15 (°F)	Conduit #2 Bare #8 TC No. 16 (°F)
94	122	123	127	132	128	126	128	136
95	124	124	128	133	129	127	129	137
96	125	125	129	135	131	128	130	138
97	127	127	131	136	132	130	132	140
98	128	128	132	138	133	131	133	141
99	130	130	133	139	135	132	134	142
100	132	131	135	140	136	133	136	144
101	133	133	136	142	137	135	137	145
102	135	134	138	143	139	136	138	146
103	137	136	139	145	140	137	139	147
104	139	138	141	146	142	139	141	149
105	141	139	143	148	143	140	142	150
106	144	141	144	149	144	142	144	152
107	146	143	146	151	146	143	145	153
108	148	145	148	153	147	144	146	154
109	150	147	150	154	149	146	148	156
110	152	149	152	156	150	147	149	157
111	155	151	153	158	152	149	151	159
112	157	154	155	159	153	150	152	160
113	159	156	157	161	155	151	154	161
114	161	158	159	163	156	153	155	163
115	163	160	161	164	158	154	157	164
116	165	162	163	166	160	156	158	165
117	167	164	165	168	161	157	160	167
118	168	166	167	170	163	159	161	168
119	170	168	169	171	165	161	163	169
120	172	170	171	173	167	162	164	171
121	173	172	173	175	168	164	166	172
122	175	173	174	177	171	166	167	173
123	176	175	176	178	172	168	169	174
124	178	177	178	180	174	169	170	176
125	179	178	179	182	176	171	171	177
126	181	180	181	183	178	173	173	178
127	182	181	182	185	179	174	174	179
128	183	183	184	186	181	176	176	180
129	184	184	185	187	182	177	177	182
130	185	185	187	189	183	179	179	183
131	187	186	188	190	185	180	180	184
132	188	188	189	191	186	181	181	185
133	189	189	190	192	187	183	183	186
134	190	190	191	193	188	184	184	187
135	191	191	192	194	190	185	185	188
136	191	192	193	195	191	186	186	189
137	192	193	194	196	192	188	187	190
138	193	194	195	197	193	189	188	191
139	194	195	196	198	194	190	189	192
140	195	195	197	198	195	191	190	193

OMEGA POINT LABORATORIES

Time (min)	Conduit #2 Bare #8 TC No. 9 (°F)	Conduit #2 Bare #8 TC No. 10 (°F)	Conduit #2 Bare #8 TC No. 11 (°F)	Conduit #2 Bare #8 TC No. 12 (°F)	Conduit #2 Bare #8 TC No. 13 (°F)	Conduit #2 Bare #8 TC No. 14 (°F)	Conduit #2 Bare #8 TC No. 15 (°F)	Conduit #2 Bare #8 TC No. 16 (°F)
141	196	196	198	199	195	192	191	194
142	196	197	198	200	196	193	192	194
143	197	198	199	201	197	194	193	195
144	198	199	200	201	198	194	194	196
145	199	199	201	202	198	195	195	197
146	199	200	201	203	199	196	196	198
147	200	201	202	203	200	197	197	198
148	200	201	203	204	201	198	198	199
149	201	202	203	204	201	199	198	200
150	202	202	204	205	202	199	199	201
151	202	203	204	206	203	200	200	201
152	203	204	205	206	203	201	201	202
153	203	204	205	207	204	202	202	203
154	204	205	206	207	205	202	202	204
155	204	205	206	208	205	203	203	205
156	205	206	207	209	206	204	204	205
157	205	206	208	209	207	205	205	206
158	206	207	208	210	207	206	206	207
159	206	207	209	211	208	206	206	208
160	207	208	209	211	209	207	207	209
161	208	208	210	212	209	208	208	210
162	208	209	210	212	210	209	209	210
163	209	209	211	213	211	210	210	211
164	209	210	212	214	212	210	211	212
165	210	211	212	215	213	211	212	213
166	210	211	213	215	213	212	212	214
167	210	211	214	216	214	213	213	215
168	211	211	214	217	215	214	214	216
169	211	212	214	217	216	215	215	217
170	211	212	213	215	216	215	216	218
171	211	211	212	213	216	216	217	212
172	211	211	211	212	216	217	216	211
173	211	211	211	211	216	217	217	214
174	211	211	210	210	215	217	217	217
175	212	211	210	210	215	218	218	219
176	212	211	210	210	216	218	220	220
177	212	211	210	210	216	219	221	222
178	212	212	210	211	217	220	222	223
179	213	212	211	212	217	221	223	224
180	213	212	211	212	218	222	224	226

Time (min)	Conduit #2 Bare #8 TC No. 17 (°F)	Conduit #2 Bare #8 TC No. 18 (°F)	Conduit #2 Bare #8 TC No. 19 (°F)	Conduit #2 Bare #8 TC No. 20 (°F)	Conduit #2 Bare #8 TC No. 21 (°F)	Conduit #2 Bare #8 TC No. 22 (°F)	Conduit #2 Bare #8 TC No. 23 (°F)	Conduit #2 Bare #8 TC No. 24 (°F)
0	66	66	66	66	66	66	66	66
1	66	66	66	66	66	66	66	66
2	66	66	66	66	66	66	66	66
3	66	66	66	66	66	66	66	66
4	66	66	66	66	66	66	66	66
5	66	66	66	66	66	66	66	66
6	66	66	66	66	66	66	66	66
7	66	66	66	66	66	66	66	66
8	66	66	66	66	66	66	66	66
9	66	66	66	66	66	66	66	66
10	66	66	66	66	66	66	66	66
11	66	66	66	66	66	66	66	66
12	66	66	66	66	66	66	66	66
13	66	66	66	66	66	66	66	66
14	66	66	66	66	66	66	66	66
15	66	66	66	66	66	66	66	66
16	66	66	66	66	66	66	66	66
17	67	66	66	66	66	66	66	66
18	67	66	66	66	66	66	66	66
19	67	66	66	66	66	66	66	66
20	67	66	66	66	66	66	66	66
21	67	66	66	66	66	66	66	66
22	67	66	66	66	66	66	66	66
23	67	66	66	66	66	66	66	66
24	67	67	66	66	66	66	66	66
25	67	67	66	66	66	66	66	66
26	68	67	66	66	66	66	66	66
27	68	67	66	66	66	66	66	66
28	68	67	66	66	66	66	66	66
29	68	67	67	66	66	66	66	66
30	68	67	67	66	66	66	66	66
31	69	67	67	66	66	66	66	66
32	69	67	67	66	66	66	66	66
33	69	68	67	66	66	66	66	66
34	69	68	67	67	66	66	66	66
35	70	68	67	67	66	66	66	66
36	70	68	67	67	66	66	66	67
37	71	68	67	67	66	66	66	67
38	72	69	67	67	67	66	66	67
39	73	69	68	67	67	67	67	67
40	74	69	68	67	67	67	67	67
41	75	70	68	67	67	67	67	67
42	76	71	68	67	67	67	67	67
43	77	71	69	67	67	67	67	67
44	78	72	69	68	67	67	67	67
45	79	72	69	68	67	67	67	67
46	80	73	70	68	67	67	67	67

OMEGA POINT LABORATORIES

Time (min)	Conduit #2 Bare #8 TC No. 17 (°F)	Conduit #2 Bare #8 TC No. 18 (°F)	Conduit #2 Bare #8 TC No. 19 (°F)	Conduit #2 Bare #8 TC No. 20 (°F)	Conduit #2 Bare #8 TC No. 21 (°F)	Conduit #2 Bare #8 TC No. 22 (°F)	Conduit #2 Bare #8 TC No. 23 (°F)	Conduit #2 Bare #8 TC No. 24 (°F)
47	82	74	70	68	68	67	67	67
48	83	75	71	69	68	67	68	67
49	84	75	71	69	68	68	68	68
50	85	76	72	69	68	68	68	68
51	86	77	72	70	68	68	68	68
52	87	78	73	70	69	68	68	68
53	89	79	73	70	69	68	69	68
54	90	79	74	71	69	69	69	69
55	91	80	74	71	70	69	69	69
56	92	81	75	72	70	69	69	69
57	93	82	76	72	70	70	70	69
58	94	83	76	72	71	70	70	70
59	96	84	77	73	71	70	70	70
60	97	85	78	73	71	71	71	70
61	98	86	78	74	72	71	71	71
62	99	87	79	75	72	71	72	71
63	100	87	80	75	73	72	72	72
64	101	88	81	76	73	72	73	72
65	103	89	81	76	74	73	73	72
66	104	90	82	77	74	73	74	73
67	105	91	83	78	75	74	74	73
68	106	92	84	78	75	74	75	74
69	107	93	85	79	76	75	75	75
70	108	94	85	80	77	76	76	75
71	109	95	86	80	77	76	76	76
72	110	96	87	81	78	77	77	76
73	112	97	88	82	79	77	78	77
74	113	98	89	83	79	78	78	78
75	114	99	90	83	80	79	79	78
76	115	100	91	84	81	80	80	79
77	116	101	91	85	82	80	80	80
78	117	102	92	86	82	81	81	80
79	118	103	93	87	83	82	82	81
80	119	104	94	87	84	82	83	82
81	120	105	95	88	85	83	84	83
82	121	106	96	89	85	84	84	84
83	122	107	97	90	86	85	85	84
84	123	108	98	91	87	86	86	85
85	124	109	99	92	88	86	87	86
86	125	110	100	93	89	87	88	87
87	126	111	101	94	90	88	88	88
88	127	112	101	94	90	89	89	89
89	128	113	102	95	91	90	90	89
90	129	114	103	96	92	91	91	90
91	130	115	104	97	93	92	92	91
92	132	116	105	98	94	93	93	92
93	132	117	106	99	95	93	94	93

Time (min)	Conduit #2 Bare #8 TC No. 17 (°F)	Conduit #2 Bare #8 TC No. 18 (°F)	Conduit #2 Bare #8 TC No. 19 (°F)	Conduit #2 Bare #8 TC No. 20 (°F)	Conduit #2 Bare #8 TC No. 21 (°F)	Conduit #2 Bare #8 TC No. 22 (°F)	Conduit #2 Bare #8 TC No. 23 (°F)	Conduit #2 Bare #8 TC No. 24 (°F)
94	134	118	107	100	96	94	95	94
95	135	119	108	101	97	95	96	95
96	136	120	109	102	98	96	97	96
97	137	121	110	103	99	97	98	97
98	138	122	111	104	100	98	99	98
99	139	123	112	105	101	99	100	99
100	141	124	113	106	102	100	101	100
101	142	125	115	107	103	101	102	101
102	143	127	116	108	104	102	103	102
103	144	128	117	109	105	103	104	103
104	145	129	118	110	106	104	105	104
105	147	130	119	111	107	105	106	106
106	148	131	120	112	108	106	108	107
107	149	132	121	113	109	108	109	108
108	150	133	122	114	110	109	110	110
109	152	135	123	115	111	110	112	111
110	153	136	124	117	112	111	113	112
111	154	137	126	118	113	113	114	114
112	155	138	127	119	115	114	116	115
113	156	139	128	120	116	115	117	116
114	158	140	129	121	117	116	119	118
115	159	142	130	122	118	118	120	119
116	160	143	131	123	119	119	122	120
117	161	144	133	125	121	120	123	122
118	162	145	134	126	122	122	125	123
119	163	146	135	127	123	123	127	125
120	165	147	136	128	125	125	128	126
121	166	149	137	130	126	126	130	128
122	167	150	139	131	127	127	131	129
123	168	151	140	132	129	129	133	131
124	169	153	141	134	130	130	134	132
125	171	154	143	135	132	132	136	134
126	172	155	144	137	133	133	137	135
127	173	156	145	138	134	135	139	137
128	174	158	147	139	136	136	141	139
129	175	159	148	141	137	138	142	140
130	176	160	149	142	139	139	144	142
131	178	162	151	144	140	141	145	143
132	179	163	152	145	142	142	147	145
133	180	164	154	147	143	144	148	147
134	181	166	155	148	145	145	150	148
135	182	167	157	150	147	147	152	150
136	183	168	158	151	148	149	153	152
137	184	169	160	153	150	150	155	153
138	185	171	161	154	151	152	157	155
139	186	172	162	156	153	154	158	156
140	187	173	164	158	155	155	160	158

OMEGA POINT LABORATORIES

Time (min)	Conduit #2 Bare #8 TC No. 17 (°F)	Conduit #2 Bare #8 TC No. 18 (°F)	Conduit #2 Bare #8 TC No. 19 (°F)	Conduit #2 Bare #8 TC No. 20 (°F)	Conduit #2 Bare #8 TC No. 21 (°F)	Conduit #2 Bare #8 TC No. 22 (°F)	Conduit #2 Bare #8 TC No. 23 (°F)	Conduit #2 Bare #8 TC No. 24 (°F)
141	188	175	165	159	156	157	161	160
142	189	176	167	161	158	158	163	161
143	190	177	168	162	160	160	164	163
144	191	178	170	164	161	162	166	164
145	192	180	171	165	163	163	167	166
146	193	181	172	167	165	165	169	167
147	194	182	174	168	166	166	170	169
148	195	183	175	170	168	168	172	170
149	196	184	176	171	169	169	173	172
150	196	186	177	173	170	170	174	173
151	197	187	179	174	172	172	176	175
152	198	188	180	175	173	173	177	176
153	199	189	181	177	174	174	178	177
154	200	190	183	178	176	176	179	179
155	201	192	184	179	177	177	180	180
156	202	193	185	180	178	178	182	181
157	203	194	187	182	180	179	183	183
158	204	195	188	183	181	180	184	184
159	205	196	189	184	182	182	185	185
160	206	197	190	185	183	183	186	186
161	207	199	191	186	184	184	188	187
162	208	200	193	188	185	185	189	189
163	209	201	194	189	186	186	190	190
164	210	202	195	190	187	187	190	191
165	211	203	196	191	189	188	191	192
166	212	204	197	192	190	189	192	193
167	213	205	198	193	191	190	193	194
168	214	207	200	194	192	191	194	194
169	215	207	201	195	192	192	195	195
170	214	208	201	196	193	192	195	196
171	205	207	202	197	194	193	196	197
172	204	206	202	198	195	194	197	198
173	210	207	203	199	196	195	198	198
174	214	208	204	200	196	195	198	199
175	217	210	205	201	197	196	199	199
176	219	212	206	202	198	196	199	200
177	220	213	208	203	198	197	200	201
178	222	215	209	204	198	198	200	201
179	223	216	210	204	199	198	200	201
180	225	218	211	205	199	198	201	202

Time (min)	Conduit #2 Bare #8 TC No. 25 (°F)	Conduit #2 Bare #8 TC No. 26 (°F)	Conduit #2 Bare #8 TC No. 27 (°F)	Conduit #2 Bare #8 TC No. 28 (°F)	Conduit #2 Bare #8 TC No. 29 (°F)	Conduit #2 Bare #8 TC No. 30 (°F)	Conduit #4 Bare #8 TC No. 31 (°F)	Conduit #4 Bare #8 TC No. 32 (°F)
0	66	67	67	67	68	68	68	68
1	66	67	67	67	68	68	68	68
2	66	67	67	67	68	68	68	68
3	66	67	67	67	68	68	68	68
4	66	67	67	67	68	68	68	68
5	66	67	67	67	68	68	68	68
6	66	67	67	67	68	68	68	68
7	66	67	67	67	68	68	68	68
8	66	67	67	67	68	68	68	68
9	66	67	67	67	68	68	68	68
10	66	67	67	67	68	68	68	68
11	66	67	67	67	68	68	68	68
12	66	67	67	67	68	68	68	68
13	66	67	67	67	68	68	68	68
14	66	67	67	67	68	68	68	68
15	66	67	67	67	68	68	68	68
16	66	67	67	67	68	68	68	68
17	66	67	67	67	68	68	69	68
18	66	67	67	67	68	68	69	68
19	66	67	67	67	68	68	69	68
20	66	67	67	67	68	68	69	68
21	66	67	67	67	68	68	69	68
22	66	67	67	67	68	68	69	68
23	66	67	67	67	68	69	69	69
24	66	67	67	67	68	69	70	69
25	66	67	67	67	68	69	70	69
26	66	67	67	67	68	69	70	69
27	66	67	67	67	68	69	70	69
28	66	67	67	67	68	69	71	70
29	66	67	67	67	68	69	71	70
30	66	67	67	67	68	69	71	70
31	66	67	67	67	68	69	72	70
32	67	67	67	67	68	69	72	71
33	67	67	67	67	68	69	72	71
34	67	67	67	67	68	69	73	72
35	67	67	67	67	68	69	73	72
36	67	67	67	68	68	69	74	72
37	67	67	67	68	68	70	74	73
38	67	67	67	68	68	70	75	73
39	67	67	67	68	69	70	75	74
40	67	67	67	68	69	70	76	74
41	67	67	67	68	69	70	76	75
42	67	67	67	68	69	70	77	76
43	67	67	67	68	69	70	78	76
44	67	67	68	68	69	70	78	77
45	67	67	68	68	69	71	79	77
46	67	67	68	68	69	71	80	78

Time (min)	Conduit #2 Bare #8 TC No. 25 (°F)	Conduit #2 Bare #8 TC No. 26 (°F)	Conduit #2 Bare #8 TC No. 27 (°F)	Conduit #2 Bare #8 TC No. 28 (°F)	Conduit #2 Bare #8 TC No. 29 (°F)	Conduit #2 Bare #8 TC No. 30 (°F)	Conduit #4 Bare #8 TC No. 31 (°F)	Conduit #4 Bare #8 TC No. 32 (°F)
47	67	68	68	69	70	71	80	79
48	68	68	68	69	70	71	81	80
49	68	68	68	69	70	71	82	80
50	68	68	68	69	70	72	83	81
51	68	68	68	69	70	72	83	82
52	68	68	69	69	71	72	84	83
53	68	68	69	70	71	73	85	83
54	69	69	69	70	71	73	86	84
55	69	69	69	70	71	73	87	85
56	69	69	69	70	72	74	88	86
57	69	69	70	71	72	74	89	87
58	70	70	70	71	72	74	90	88
59	70	70	70	71	73	75	90	89
60	70	70	71	71	73	75	91	90
61	71	70	71	72	73	75	92	91
62	71	71	71	72	74	76	93	92
63	71	71	72	73	74	76	94	93
64	72	72	72	73	75	76	95	94
65	72	72	72	73	75	77	96	95
66	73	72	73	74	76	77	98	96
67	73	73	73	74	76	78	99	97
68	74	73	74	75	76	78	100	99
69	74	74	74	75	77	78	101	100
70	75	74	75	76	77	79	103	101
71	75	75	75	76	78	79	104	103
72	76	75	76	77	78	80	105	104
73	76	76	76	78	79	80	107	106
74	77	77	77	78	80	81	109	107
75	78	77	78	79	80	81	110	109
76	78	78	78	80	81	82	112	111
77	79	79	79	80	81	82	114	113
78	80	79	80	81	82	83	116	115
79	81	80	80	81	83	83	117	117
80	81	81	81	82	83	84	119	119
81	82	82	82	83	84	84	121	121
82	83	82	83	84	84	85	123	123
83	84	83	83	84	85	85	124	125
84	85	84	84	85	86	86	126	127
85	85	85	85	86	86	86	128	129
86	86	86	86	86	87	87	129	131
87	87	86	87	87	88	88	131	133
88	88	87	87	88	88	88	132	135
89	89	88	88	89	89	89	134	137
90	90	89	89	90	90	89	135	139
91	91	90	90	90	91	90	137	140
92	91	91	91	91	91	91	138	142
93	92	92	92	92	92	91	139	144

Time (min)	Conduit #2 Bare #8 TC No. 25 (°F)	Conduit #2 Bare #8 TC No. 26 (°F)	Conduit #2 Bare #8 TC No. 27 (°F)	Conduit #2 Bare #8 TC No. 28 (°F)	Conduit #2 Bare #8 TC No. 29 (°F)	Conduit #2 Bare #8 TC No. 30 (°F)	Conduit #4 Bare #8 TC No. 31 (°F)	Conduit #4 Bare #8 TC No. 32 (°F)
94	93	92	92	93	93	92	141	145
95	94	93	93	94	94	93	142	146
96	95	94	94	94	94	93	143	148
97	96	95	95	95	95	94	144	149
98	97	96	96	96	96	95	145	150
99	98	97	97	97	97	95	146	151
100	99	98	98	98	98	96	147	153
101	100	99	99	99	98	97	148	154
102	101	100	100	100	99	97	148	154
103	102	101	101	101	100	98	149	155
104	104	102	102	102	101	99	150	156
105	105	103	103	103	102	99	151	157
106	106	104	104	104	103	100	151	158
107	107	106	105	105	104	101	152	158
108	108	107	106	106	105	102	153	159
109	109	108	107	107	105	103	153	160
110	111	109	108	108	106	103	154	160
111	112	110	109	109	107	104	155	161
112	113	111	110	110	108	105	155	162
113	114	112	112	111	109	106	156	163
114	116	114	113	112	110	107	156	163
115	117	115	114	113	111	108	157	164
116	118	116	115	114	112	109	158	164
117	120	117	116	115	113	110	158	165
118	121	119	117	116	114	110	159	166
119	122	120	119	117	115	112	160	166
120	124	121	120	118	116	112	160	167
121	125	122	121	120	118	114	161	167
122	126	124	122	121	119	115	161	168
123	127	125	123	122	120	116	162	169
124	129	127	125	123	121	117	162	169
125	130	127	126	124	122	118	163	170
126	132	129	128	126	124	120	163	170
127	133	130	129	127	125	121	164	171
128	135	132	130	128	126	123	164	171
129	136	133	131	130	128	124	165	172
130	138	135	133	131	129	125	166	173
131	139	137	134	133	131	127	166	173
132	141	138	136	134	132	128	167	174
133	142	139	137	136	134	130	167	174
134	144	141	139	137	135	131	168	175
135	145	143	140	139	137	132	169	176
136	147	146	142	140	138	134	169	176
137	149	146	144	142	140	135	170	177
138	151	149	146	144	141	136	170	178
139	153	150	147	145	143	138	171	178
140	154	151	148	147	144	139	171	178

Time (min)	Conduit #2 Bare #8 TC No. 25 (°F)	Conduit #2 Bare #8 TC No. 26 (°F)	Conduit #2 Bare #8 TC No. 27 (°F)	Conduit #2 Bare #8 TC No. 28 (°F)	Conduit #2 Bare #8 TC No. 29 (°F)	Conduit #2 Bare #8 TC No. 30 (°F)	Conduit #4 Bare #8 TC No. 31 (°F)	Conduit #4 Bare #8 TC No. 32 (°F)
141	156	153	150	148	145	140	172	179
142	158	154	152	149	147	141	172	179
143	159	157	153	151	148	142	173	180
144	161	159	155	153	149	143	174	180
145	163	160	156	155	152	144	174	181
146	164	162	158	156	153	146	175	181
147	166	164	159	157	153	148	176	182
148	167	163	161	158	154	148	177	182
149	169	166	163	160	155	150	178	183
150	171	167	165	160	157	153	179	183
151	172	169	165	162	159	152	179	184
152	173	169	168	164	160	154	180	184
153	174	171	168	165	161	156	180	185
154	176	172	169	166	163	156	181	185
155	177	174	170	169	164	158	182	186
156	178	176	172	168	165	160	184	187
157	180	174	173	171	167	160	184	187
158	181	178	173	171	167	162	186	188
159	182	178	174	173	167	161	185	188
160	184	181	177	175	171	162	185	188
161	184	179	178	175	173	164	187	189
162	186	181	179	176	172	165	186	189
163	188	182	181	176	174	166	188	190
164	187	183	180	177	173	166	188	190
165	190	185	182	180	172	168	188	191
166	191	186	183	180	177	169	189	191
167	192	187	184	181	174	169	187	191
168	192	188	185	182	176	172	187	192
169	193	188	187	180	177	174	190	193
170	193	189	186	183	179	175	190	193
171	195	190	187	185	180	174	193	194
172	195	190	189	186	180	177	192	193
173	196	193	189	186	183	175	192	194
174	198	193	190	188	183	176	192	193
175	198	193	190	189	185	178	194	194
176	198	194	193	187	183	176	193	195
177	199	194	190	186	184	178	193	194
178	199	196	192	190	187	179	193	195
179	200	196	194	191	187	181	195	197
180	200	194	191	190	188	180	196	197

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Bare #8 TC No. 33 (°F)	Conduit #4 Bare #8 TC No. 34 (°F)	Conduit #4 Bare #8 TC No. 35 (°F)	Conduit #4 Bare #8 TC No. 36 (°F)	Conduit #4 Bare #8 TC No. 37 (°F)	Conduit #4 Bare #8 TC No. 38 (°F)	Conduit #4 Bare #8 TC No. 39 (°F)	Conduit #4 Bare #8 TC No. 40 (°F)
0	67	67	67	66	66	66	66	66
1	67	67	67	66	66	66	66	66
2	67	67	67	66	66	66	66	66
3	67	67	67	66	66	66	66	66
4	67	67	67	66	66	66	66	66
5	67	67	67	66	66	66	66	66
6	67	67	67	66	66	66	66	66
7	67	67	67	66	66	66	66	66
8	67	67	67	66	66	66	66	66
9	67	67	67	66	66	66	66	66
10	67	67	67	66	66	66	66	66
11	67	67	67	66	66	66	67	66
12	67	67	67	67	66	66	67	66
13	67	67	67	66	67	67	67	67
14	67	67	67	67	67	67	68	67
15	67	67	67	67	67	68	69	67
16	67	67	67	67	67	68	69	68
17	67	67	67	67	67	69	70	68
18	67	67	67	67	68	69	71	69
19	67	67	67	67	68	70	72	69
20	67	67	67	67	68	71	73	70
21	68	67	67	68	69	72	74	70
22	68	67	67	68	69	73	75	71
23	68	67	67	68	70	74	76	72
24	68	67	67	68	70	75	77	72
25	68	68	68	69	71	76	79	73
26	68	68	68	69	72	77	80	74
27	68	68	68	69	72	78	81	75
28	68	68	68	70	73	79	82	75
29	69	68	69	70	74	80	83	76
30	69	68	69	71	74	81	83	77
31	69	69	69	71	75	82	84	77
32	69	69	69	72	76	83	85	78
33	70	69	70	72	76	83	86	78
34	70	69	70	72	77	84	87	79
35	70	70	70	73	78	85	87	79
36	70	70	71	73	78	86	88	80
37	71	70	71	74	79	86	88	80
38	71	71	71	74	79	87	89	81
39	72	71	72	75	80	87	89	81
40	72	72	72	75	80	88	89	82
41	72	72	73	76	81	88	89	82
42	73	72	73	76	81	89	90	82
43	73	73	74	77	82	89	90	83
44	74	73	74	77	82	89	90	83
45	74	74	74	78	83	90	91	83
46	75	74	75	78	83	90	91	84

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Bare #8 TC No. 33 (°F)	Conduit #4 Bare #8 TC No. 34 (°F)	Conduit #4 Bare #8 TC No. 35 (°F)	Conduit #4 Bare #8 TC No. 36 (°F)	Conduit #4 Bare #8 TC No. 37 (°F)	Conduit #4 Bare #8 TC No. 38 (°F)	Conduit #4 Bare #8 TC No. 39 (°F)	Conduit #4 Bare #8 TC No. 40 (°F)
47	76	75	75	79	84	90	91	84
48	76	75	76	79	84	91	92	85
49	77	76	77	80	85	91	92	85
50	78	77	77	80	85	91	92	86
51	78	77	78	81	86	92	93	86
52	79	78	78	81	86	92	93	87
53	80	79	79	82	87	93	94	88
54	81	79	79	82	87	93	94	88
55	81	80	80	83	88	94	95	89
56	82	81	81	84	88	94	95	90
57	83	81	81	84	89	95	96	90
58	84	82	82	85	90	95	97	91
59	85	83	83	85	90	96	97	92
60	86	84	84	86	91	96	98	93
61	87	85	84	87	91	97	99	93
62	88	85	85	88	92	98	99	94
63	88	86	86	88	93	98	100	95
64	89	87	87	89	93	99	101	96
65	90	88	87	90	94	99	101	97
66	91	89	88	90	95	100	102	98
67	92	90	89	91	96	101	103	99
68	93	91	90	92	96	102	104	99
69	95	92	91	93	97	102	105	100
70	96	93	91	93	98	103	105	101
71	97	94	92	94	99	104	106	102
72	98	94	93	95	99	105	107	103
73	99	96	94	96	100	105	108	104
74	101	97	95	97	101	106	109	105
75	102	98	96	98	102	107	110	106
76	104	99	97	99	103	108	111	107
77	105	100	98	99	104	109	112	108
78	107	102	99	100	105	110	113	109
79	109	103	100	101	106	110	114	110
80	111	104	101	102	106	111	114	111
81	113	106	102	103	107	112	115	112
82	115	107	103	104	108	113	116	113
83	117	109	105	105	109	114	117	114
84	119	111	106	106	110	115	118	115
85	121	113	107	108	111	116	119	117
86	124	115	109	109	112	117	120	118
87	126	117	110	110	113	118	121	119
88	128	119	112	111	115	119	122	120
89	131	122	114	113	116	120	123	121
90	133	124	116	114	117	121	124	122
91	135	127	118	116	118	122	125	123
92	138	129	119	117	119	123	126	124
93	140	131	121	118	120	124	127	125

Time (min)	Conduit #4 Bare #8 TC No. 33 (°F)	Conduit #4 Bare #8 TC No. 34 (°F)	Conduit #4 Bare #8 TC No. 35 (°F)	Conduit #4 Bare #8 TC No. 36 (°F)	Conduit #4 Bare #8 TC No. 37 (°F)	Conduit #4 Bare #8 TC No. 38 (°F)	Conduit #4 Bare #8 TC No. 39 (°F)	Conduit #4 Bare #8 TC No. 40 (°F)
94	142	134	124	120	122	125	128	126
95	144	136	126	121	123	126	129	128
96	146	139	128	123	124	127	130	129
97	148	141	131	125	126	128	131	130
98	149	143	134	127	127	129	133	131
99	151	146	136	129	129	130	134	132
100	152	148	139	131	131	132	135	134
101	154	150	141	134	132	133	136	135
102	155	152	144	136	134	135	137	136
103	157	153	146	139	136	136	139	137
104	158	155	149	141	138	138	140	139
105	159	157	151	144	141	139	141	140
106	160	158	153	146	143	141	143	141
107	161	160	155	149	146	143	144	143
108	162	161	157	151	148	145	146	144
109	163	163	159	154	151	147	147	146
110	164	164	161	156	153	148	149	147
111	165	165	163	158	155	150	150	148
112	166	166	164	160	157	152	152	150
113	167	167	166	162	160	154	153	151
114	167	168	167	164	162	156	155	153
115	168	169	168	166	164	158	157	154
116	169	170	170	167	165	160	159	156
117	170	171	171	169	167	162	161	158
118	170	172	172	170	169	164	162	159
119	171	173	173	172	170	166	164	161
120	172	174	174	173	172	168	166	163
121	172	175	175	174	173	170	168	164
122	173	175	176	175	175	172	170	166
123	174	176	177	176	176	173	172	168
124	174	177	178	177	177	175	174	170
125	175	178	178	178	179	177	175	171
126	176	178	179	179	180	178	177	173
127	176	179	180	180	181	179	179	175
128	177	180	181	181	182	181	180	176
129	178	180	182	182	184	182	182	178
130	178	181	183	183	185	183	183	179
131	179	182	183	184	186	185	184	181
132	179	182	184	185	187	186	186	182
133	180	183	185	186	188	187	187	184
134	181	184	186	187	188	188	188	185
135	181	184	186	188	189	189	189	186
136	182	185	187	188	190	190	190	187
137	183	186	188	189	191	191	191	188
138	183	187	188	190	192	191	191	189
139	184	187	189	191	192	192	192	190
140	184	188	190	191	193	193	193	191

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Bare #8 TC No. 33 (°F)	Conduit #4 Bare #8 TC No. 34 (°F)	Conduit #4 Bare #8 TC No. 35 (°F)	Conduit #4 Bare #8 TC No. 36 (°F)	Conduit #4 Bare #8 TC No. 37 (°F)	Conduit #4 Bare #8 TC No. 38 (°F)	Conduit #4 Bare #8 TC No. 39 (°F)	Conduit #4 Bare #8 TC No. 40 (°F)
141	185	188	190	192	194	194	194	192
142	185	189	191	193	194	194	194	192
143	186	189	192	193	195	195	195	193
144	186	190	192	194	196	196	196	194
145	187	191	193	194	196	196	196	195
146	187	191	193	195	197	197	197	196
147	188	192	194	196	197	197	198	196
148	188	192	195	196	198	198	198	197
149	189	193	195	197	198	198	199	198
150	189	193	196	197	199	199	199	198
151	189	193	196	198	199	199	200	199
152	190	194	196	198	199	200	200	200
153	190	194	197	198	200	200	201	200
154	190	194	197	199	200	200	201	201
155	191	195	198	199	200	201	202	201
156	191	195	198	199	201	201	202	202
157	192	195	198	200	201	201	202	203
158	192	196	198	200	201	202	203	203
159	192	196	199	200	201	202	203	204
160	193	196	199	200	201	202	204	204
161	193	197	199	201	202	203	204	205
162	193	197	200	201	202	203	204	206
163	194	197	200	201	202	203	205	206
164	194	197	200	201	202	203	205	207
165	194	198	200	202	203	204	205	207
166	194	198	201	202	203	204	206	208
167	195	198	201	202	203	204	206	208
168	195	198	201	202	203	205	206	209
169	195	199	201	203	204	205	207	209
170	196	199	202	203	204	205	207	210
171	196	199	202	203	204	206	208	210
172	197	199	202	204	205	206	208	211
173	196	200	202	204	205	206	208	211
174	196	200	203	204	205	207	209	212
175	197	200	203	204	206	207	209	212
176	197	199	203	205	206	207	209	213
177	197	199	202	205	206	208	210	213
178	197	199	202	205	206	208	210	213
179	199	200	202	204	205	209	211	214
180	198	200	201	204	205	209	211	214

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Bare #8 TC No. 41 (°F)	Conduit #4 Bare #8 TC No. 42 (°F)	Conduit #4 Bare #8 TC No. 43 (°F)	Conduit #4 Bare #8 TC No. 44 (°F)	Conduit #4 Bare #8 TC No. 45 (°F)	Conduit #4 Bare #8 TC No. 46 (°F)	Conduit #4 Bare #8 TC No. 47 (°F)	Conduit #4 Bare #8 TC No. 48 (°F)
0	67	67	67	67	67	67	67	67
1	67	67	67	67	67	67	67	67
2	67	67	67	67	67	67	67	67
3	67	67	67	67	67	67	67	67
4	67	67	67	67	67	67	67	67
5	67	67	67	67	67	67	67	67
6	67	67	67	67	67	67	67	67
7	67	67	67	67	67	67	67	67
8	67	67	67	67	67	67	67	67
9	67	67	67	67	67	67	67	67
10	67	67	67	67	67	67	67	67
11	67	67	67	67	67	67	67	67
12	67	67	67	67	67	67	67	67
13	67	67	67	67	67	67	67	67
14	67	67	67	67	67	67	67	67
15	67	67	67	67	67	67	67	67
16	67	67	67	67	67	67	67	67
17	67	67	67	67	67	67	67	67
18	68	67	67	67	67	67	67	67
19	68	67	67	67	67	67	67	67
20	68	67	67	67	67	67	67	67
21	68	68	67	67	67	67	67	67
22	69	68	67	67	67	67	67	67
23	69	68	67	67	67	67	67	67
24	70	68	67	67	67	67	67	67
25	70	68	68	67	67	67	67	67
26	70	69	68	67	67	67	67	67
27	71	69	68	67	67	67	67	67
28	71	69	68	67	67	67	67	67
29	72	69	68	67	67	67	67	67
30	72	70	68	68	67	67	67	67
31	72	70	69	68	67	67	67	67
32	73	70	69	68	67	67	67	67
33	73	71	69	68	67	67	67	67
34	74	71	69	68	67	67	67	67
35	74	71	69	68	67	67	67	67
36	74	72	70	68	68	67	67	67
37	75	72	70	69	68	67	67	67
38	75	72	70	69	68	67	67	67
39	76	73	71	69	68	67	67	67
40	76	73	71	69	68	67	67	67
41	77	73	71	70	68	67	67	67
42	77	74	72	70	68	68	67	67
43	77	74	72	70	69	68	67	67
44	78	75	73	71	69	68	67	67
45	78	75	74	71	69	68	67	67
46	79	76	75	72	69	68	68	67

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Bare #8 TC No. 41 (°F)	Conduit #4 Bare #8 TC No. 42 (°F)	Conduit #4 Bare #8 TC No. 43 (°F)	Conduit #4 Bare #8 TC No. 44 (°F)	Conduit #4 Bare #8 TC No. 45 (°F)	Conduit #4 Bare #8 TC No. 46 (°F)	Conduit #4 Bare #8 TC No. 47 (°F)	Conduit #4 Bare #8 TC No. 48 (°F)
47	80	77	76	73	70	68	68	67
48	80	78	77	74	70	68	68	68
49	81	78	78	75	71	69	68	68
50	81	79	80	76	71	69	68	68
51	82	80	81	78	72	69	68	68
52	83	81	83	79	72	70	69	68
53	84	82	84	80	73	70	69	68
54	84	83	86	82	74	70	69	68
55	85	84	87	83	75	71	69	69
56	86	85	89	85	76	71	70	69
57	87	86	91	86	77	72	70	69
58	88	88	92	88	77	72	70	70
59	89	89	94	89	78	73	71	70
60	90	90	96	91	79	73	71	70
61	91	91	98	93	80	74	72	71
62	92	92	100	94	81	75	72	71
63	92	93	101	96	82	75	72	71
64	93	95	103	98	84	76	73	72
65	94	96	105	99	85	77	74	72
66	95	97	107	101	86	78	74	73
67	96	98	108	103	87	78	75	73
68	97	100	110	104	88	79	75	74
69	99	101	111	106	89	80	76	74
70	100	102	113	107	90	81	77	75
71	101	103	114	108	91	82	77	76
72	102	104	116	110	92	82	78	76
73	103	106	117	111	94	83	79	77
74	104	107	118	112	95	84	80	78
75	105	108	120	114	96	85	80	78
76	106	109	121	115	97	86	81	79
77	107	110	122	116	98	87	82	80
78	108	111	123	117	99	88	83	81
79	109	112	125	119	100	89	84	81
80	110	113	126	120	101	90	84	82
81	111	115	127	121	102	91	85	83
82	112	116	128	122	103	92	86	84
83	113	117	129	123	104	92	87	85
84	114	118	130	124	105	93	88	85
85	116	119	132	125	106	94	89	86
86	117	120	133	127	107	95	90	87
87	118	121	134	128	108	96	91	88
88	119	123	135	129	109	97	91	89
89	120	124	136	130	110	98	92	90
90	121	125	137	131	111	99	93	91
91	122	126	138	132	112	100	94	92
92	124	127	140	133	114	101	95	92
93	125	129	141	134	115	102	96	93

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Bare #8 TC No. 41 (°F)	Conduit #4 Bare #8 TC No. 42 (°F)	Conduit #4 Bare #8 TC No. 43 (°F)	Conduit #4 Bare #8 TC No. 44 (°F)	Conduit #4 Bare #8 TC No. 45 (°F)	Conduit #4 Bare #8 TC No. 46 (°F)	Conduit #4 Bare #8 TC No. 47 (°F)	Conduit #4 Bare #8 TC No. 48 (°F)
94	126	130	142	135	116	103	97	94
95	127	131	143	136	117	104	98	95
96	128	132	144	138	118	105	99	96
97	130	133	146	139	119	106	100	97
98	131	135	147	140	120	107	101	98
99	132	136	148	141	121	108	102	99
100	133	137	149	142	122	109	103	101
101	135	139	150	143	123	110	104	102
102	136	140	151	144	124	111	105	103
103	137	141	152	145	125	112	106	104
104	139	142	154	146	126	114	107	105
105	140	144	155	148	127	115	109	106
106	141	145	156	149	128	116	110	108
107	143	146	157	150	130	117	111	109
108	144	148	159	151	131	118	112	110
109	145	149	160	152	132	119	113	111
110	147	150	161	153	133	120	114	112
111	148	152	162	155	134	121	115	114
112	150	153	163	156	135	122	117	115
113	151	155	165	157	136	124	118	116
114	152	156	166	158	138	125	119	117
115	154	157	167	159	139	126	120	119
116	155	159	168	160	140	127	121	120
117	157	160	169	161	141	128	123	121
118	158	161	170	162	142	130	124	123
119	160	163	171	163	143	131	125	124
120	161	164	172	164	144	132	127	126
121	163	166	173	165	145	133	128	127
122	165	167	175	166	147	135	130	128
123	166	168	176	167	148	136	131	130
124	168	170	177	168	149	137	132	131
125	169	171	178	169	150	139	134	133
126	171	172	179	170	152	140	135	134
127	172	174	180	171	153	141	137	136
128	174	175	181	172	154	143	138	137
129	175	176	182	173	155	144	140	139
130	177	178	183	174	157	146	141	140
131	178	179	184	175	158	147	143	142
132	179	180	185	176	159	149	144	143
133	181	181	186	177	161	150	146	145
134	182	183	187	178	162	152	147	146
135	183	184	188	179	163	153	149	148
136	184	185	189	180	164	154	150	150
137	185	186	190	181	166	156	152	151
138	187	187	191	182	167	157	154	153
139	188	188	191	183	168	159	155	155
140	189	189	192	184	169	160	157	156

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Bare #8 TC No. 41 (°F)	Conduit #4 Bare #8 TC No. 42 (°F)	Conduit #4 Bare #8 TC No. 43 (°F)	Conduit #4 Bare #8 TC No. 44 (°F)	Conduit #4 Bare #8 TC No. 45 (°F)	Conduit #4 Bare #8 TC No. 46 (°F)	Conduit #4 Bare #8 TC No. 47 (°F)	Conduit #4 Bare #8 TC No. 48 (°F)
141	189	190	193	185	171	162	158	158
142	190	191	194	186	172	163	160	159
143	191	192	194	187	173	165	161	161
144	192	192	195	188	174	166	163	163
145	193	193	196	188	175	167	164	164
146	194	194	196	189	177	169	166	166
147	195	195	197	190	178	170	167	167
148	196	196	198	191	179	171	169	168
149	196	196	198	192	180	173	170	170
150	197	197	199	192	181	174	171	171
151	198	198	199	193	182	175	173	173
152	199	199	200	194	183	176	174	174
153	200	200	200	194	184	178	175	175
154	200	200	201	195	185	179	176	176
155	201	201	201	196	186	180	178	178
156	202	202	202	196	187	181	179	179
157	203	202	202	197	188	182	180	180
158	203	203	203	197	189	183	181	181
159	204	204	203	198	190	184	182	182
160	205	205	204	199	191	185	183	184
161	206	205	204	199	191	186	184	185
162	206	206	205	200	192	187	185	186
163	207	207	205	200	193	188	186	187
164	208	207	206	201	194	189	187	188
165	208	208	206	202	195	190	188	189
166	209	209	207	202	196	191	189	190
167	210	209	207	203	196	192	190	190
168	210	210	208	203	197	192	191	191
169	211	211	208	204	197	193	191	192
170	212	211	209	203	198	194	192	193
171	212	212	207	202	199	195	193	194
172	213	212	206	201	199	195	194	195
173	214	212	206	202	199	196	195	195
174	214	213	206	202	200	197	196	196
175	215	213	206	202	200	197	196	197
176	215	214	206	202	200	198	197	197
177	216	214	207	202	201	199	197	197
178	216	215	207	203	201	199	198	198
179	217	215	207	203	202	200	199	198
180	217	216	208	204	202	200	199	198

OMEGA POINT LABORATORIES

PCI/Promatec Project No. 8610-102570 March 19, 1998

Time (min)	Conduit #4 Bare #8 TC No. 49 (°F)	Conduit #4 Bare #8 TC No. 50 (°F)	Conduit #4 Bare #8 TC No. 51 (°F)	Conduit #4 Bare #8 TC No. 52 (°F)	Conduit #4 Bare #8 TC No. 53 (°F)	Conduit #4 Bare #8 TC No. 54 (°F)	Conduit #4 Bare #8 TC No. 55 (°F)	Conduit #4 Bare #8 TC No. 56 (°F)
0	67	67	67	67	67	67	67	68
1	67	67	67	67	67	67	67	68
2	67	67	67	67	67	67	67	68
3	67	67	67	67	67	67	68	68
4	67	67	67	67	67	67	67	68
5	67	67	67	67	67	67	67	68
6	67	67	67	67	67	67	68	68
7	67	67	67	67	67	67	67	68
8	67	67	67	67	67	67	68	68
9	67	67	67	67	67	67	67	68
10	67	67	67	67	67	67	68	68
11	67	67	67	67	67	67	68	68
12	67	67	67	67	67	67	68	68
13	67	67	67	67	67	67	68	68
14	67	67	67	67	67	67	68	68
15	67	67	67	67	67	67	68	68
16	67	67	67	67	67	67	68	68
17	67	67	67	67	67	67	68	68
18	67	67	67	67	67	67	68	68
19	67	67	67	67	67	67	68	68
20	67	67	67	67	67	67	68	68
21	67	67	67	67	67	67	68	68
22	67	67	67	67	67	67	68	68
23	67	67	67	67	67	67	68	68
24	67	67	67	67	67	67	68	68
25	67	67	67	67	67	67	68	68
26	67	67	67	67	67	67	68	68
27	67	67	67	67	67	67	68	68
28	67	67	67	67	67	67	68	68
29	67	67	67	67	67	67	68	68
30	67	67	67	67	67	67	68	68
31	67	67	67	67	67	67	68	68
32	67	67	67	67	67	67	68	68
33	67	67	67	67	67	67	68	68
34	67	67	67	67	67	67	68	68
35	67	67	67	67	67	67	68	68
36	67	67	67	67	67	67	68	68
37	67	67	67	67	67	67	68	68
38	67	67	67	67	67	67	68	68
39	67	67	67	67	67	67	68	68
40	67	67	67	67	67	67	68	68
41	67	67	67	67	67	67	68	68
42	67	67	67	67	67	68	68	68
43	67	67	67	67	67	68	68	68
44	67	67	67	67	67	68	68	68
45	67	67	67	67	68	68	68	68
46	67	67	67	67	68	68	68	69

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Bare #8 TC No. 49 (°F)	Conduit #4 Bare #8 TC No. 50 (°F)	Conduit #4 Bare #8 TC No. 51 (°F)	Conduit #4 Bare #8 TC No. 52 (°F)	Conduit #4 Bare #8 TC No. 53 (°F)	Conduit #4 Bare #8 TC No. 54 (°F)	Conduit #4 Bare #8 TC No. 55 (°F)	Conduit #4 Bare #8 TC No. 56 (°F)
47	67	67	67	67	68	68	68	69
48	67	68	68	68	68	68	68	69
49	68	68	68	68	68	68	68	69
50	68	68	68	68	68	68	68	69
51	68	68	68	68	68	68	68	69
52	68	68	68	68	68	68	68	69
53	68	68	68	68	68	68	69	69
54	68	68	68	68	69	69	69	69
55	69	69	69	69	69	69	69	69
56	69	69	69	69	69	69	69	70
57	69	69	69	69	69	69	69	70
58	69	69	69	69	69	69	69	70
59	70	70	69	69	70	70	70	70
60	70	70	70	70	70	70	70	70
61	70	70	70	70	70	70	70	71
62	71	71	70	70	71	70	70	71
63	71	71	71	71	71	71	71	71
64	72	72	71	71	71	71	71	71
65	72	72	72	72	72	71	71	72
66	73	73	72	72	72	72	72	72
67	73	73	72	72	73	72	72	73
68	74	74	73	73	73	73	73	73
69	74	74	73	73	74	73	73	73
70	75	75	74	74	74	74	74	74
71	75	75	75	74	75	74	74	74
72	76	76	75	75	75	75	75	75
73	77	77	76	76	76	75	75	75
74	77	77	76	76	77	76	76	76
75	78	78	77	77	77	76	76	76
76	79	79	78	78	78	77	77	77
77	79	80	78	78	79	78	77	77
78	80	80	79	79	79	78	78	78
79	81	81	80	80	80	79	79	79
80	82	82	81	81	81	80	79	79
81	82	83	81	81	81	81	80	80
82	83	83	82	82	82	81	81	80
83	84	84	83	83	83	82	81	81
84	85	85	84	84	84	83	82	82
85	86	86	85	85	85	84	83	83
86	87	87	86	85	85	84	84	83
87	87	88	86	86	86	85	84	84
88	88	89	87	87	87	86	85	84
89	89	89	88	88	88	87	86	85
90	90	90	89	89	89	88	87	86
91	91	91	90	90	90	88	88	87
92	92	92	91	91	91	89	88	87
93	93	93	92	92	92	90	89	88

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Bare #8 TC No. 49 (°F)	Conduit #4 Bare #8 TC No. 50 (°F)	Conduit #4 Bare #8 TC No. 51 (°F)	Conduit #4 Bare #8 TC No. 52 (°F)	Conduit #4 Bare #8 TC No. 53 (°F)	Conduit #4 Bare #8 TC No. 54 (°F)	Conduit #4 Bare #8 TC No. 55 (°F)	Conduit #4 Bare #8 TC No. 56 (°F)
94	94	94	93	93	93	91	90	89
95	95	95	94	93	93	92	91	90
96	96	96	95	94	94	93	92	90
97	97	97	96	95	95	94	93	91
98	98	98	97	97	96	95	93	92
99	99	100	98	98	97	96	94	93
100	101	101	99	99	98	97	95	94
101	102	103	101	100	99	97	96	94
102	103	104	102	101	100	98	97	95
103	105	105	104	103	102	99	98	96
104	106	107	105	104	103	100	99	97
105	107	108	106	105	104	101	100	98
106	108	110	107	106	105	102	101	99
107	110	111	109	107	106	104	102	100
108	111	112	110	108	107	105	103	100
109	112	113	111	110	108	106	104	101
110	114	115	113	111	109	107	105	102
111	115	116	114	112	110	108	106	103
112	116	118	115	113	112	109	107	104
113	118	119	117	115	113	110	108	105
114	119	121	118	116	114	111	109	106
115	120	122	119	117	115	112	110	107
116	122	124	121	118	116	113	111	108
117	124	126	123	120	118	114	112	109
118	125	127	124	121	119	116	113	110
119	127	129	126	122	120	117	114	111
120	128	131	127	124	121	118	115	112
121	130	132	129	125	122	119	116	113
122	131	134	130	126	123	120	117	114
123	133	135	132	128	124	121	118	115
124	134	137	134	129	126	122	119	116
125	136	139	135	131	127	123	121	117
126	137	140	137	132	128	124	121	118
127	139	142	139	134	129	126	123	119
128	140	143	140	136	131	127	124	120
129	142	145	142	137	132	128	125	122
130	144	147	144	139	134	130	127	123
131	145	148	145	140	135	131	129	125
132	147	150	147	142	137	133	130	127
133	148	151	148	143	139	134	131	129
134	150	153	150	145	141	137	133	130
135	152	155	152	147	142	137	134	132
136	153	156	153	149	143	139	136	134
137	155	158	155	150	145	140	138	136
138	156	159	157	152	147	142	140	139
139	158	161	158	154	148	144	141	139
140	160	163	160	156	150	146	143	141

Time (min)	Conduit #4 Bare #8 TC No. 49 (°F)	Conduit #4 Bare #8 TC No. 50 (°F)	Conduit #4 Bare #8 TC No. 51 (°F)	Conduit #4 Bare #8 TC No. 52 (°F)	Conduit #4 Bare #8 TC No. 53 (°F)	Conduit #4 Bare #8 TC No. 54 (°F)	Conduit #4 Bare #8 TC No. 55 (°F)	Conduit #4 Bare #8 TC No. 56 (°F)
141	161	164	162	157	153	148	143	142
142	163	166	163	159	154	150	147	146
143	164	167	165	161	156	151	149	146
144	166	169	166	163	158	154	151	148
145	167	170	168	165	159	156	152	150
146	169	172	169	166	161	157	154	152
147	170	173	171	168	162	159	156	153
148	172	175	172	169	164	161	157	155
149	173	176	174	171	166	162	158	156
150	175	177	175	172	167	163	159	156
151	176	179	176	174	168	164	160	158
152	177	180	178	175	170	166	163	159
153	178	181	179	176	170	167	163	160
154	180	182	180	178	171	167	165	161
155	181	184	182	179	173	171	167	162
156	182	185	183	181	174	170	168	165
157	184	186	184	182	176	172	169	165
158	185	187	186	183	177	172	170	167
159	186	189	187	185	178	174	171	168
160	187	190	188	186	179	175	171	169
161	188	191	189	186	181	177	173	170
162	189	192	190	188	182	178	174	170
163	190	193	191	189	183	179	176	171
164	191	194	192	190	183	179	176	172
165	192	195	193	191	185	181	176	174
166	193	196	194	192	185	181	179	176
167	194	196	195	193	187	183	179	175
168	195	197	196	194	188	182	179	176
169	196	198	196	194	188	185	180	178
170	196	199	197	195	189	183	182	180
171	197	200	198	196	190	187	183	179
172	198	200	199	197	191	187	183	180
173	199	201	200	197	191	187	184	180
174	199	201	200	198	192	187	185	181
175	200	202	201	199	193	190	188	184
176	200	203	201	199	193	190	187	182
177	201	203	202	200	195	192	189	182
178	201	203	202	200	194	191	188	185
179	202	204	203	201	195	192	190	185
180	202	204	203	201	195	193	191	186

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Bare #8 TC No. 57 (°F)	Conduit #4 Bare #8 TC No. 58 (°F)	Conduit #4 Bare #8 TC No. 59 (°F)	Conduit #4 Bare #8 TC No. 60 (°F)	Conduit #6 Bare #8 TC No. 61 (°F)	Conduit #6 Bare #8 TC No. 62 (°F)	Conduit #6 Bare #8 TC No. 63 (°F)	Conduit #6 Bare #8 TC No. 64 (°F)
0	69	69	71	72	71	70	69	68
1	69	69	71	72	71	70	69	68
2	69	69	71	72	71	70	69	68
3	69	70	71	72	71	70	69	68
4	69	70	71	72	71	70	69	68
5	69	70	71	72	71	70	69	68
6	69	70	71	72	71	70	69	68
7	69	70	71	72	71	71	69	69
8	69	70	71	72	71	71	69	69
9	69	70	71	72	71	71	69	69
10	69	70	71	72	71	71	69	69
11	69	70	71	72	71	71	69	69
12	69	70	71	72	71	71	70	69
13	69	70	71	72	71	71	70	69
14	69	70	71	72	71	71	70	69
15	69	70	71	72	72	71	70	69
16	69	70	71	72	72	71	70	69
17	69	70	71	72	72	71	70	69
18	69	70	71	73	72	71	70	69
19	69	70	71	73	72	71	70	69
20	69	70	71	72	72	71	70	69
21	69	70	71	73	72	71	70	69
22	69	70	71	73	72	71	70	70
23	69	70	71	73	72	71	70	70
24	69	70	71	73	72	71	70	70
25	69	70	71	73	72	71	71	70
26	69	70	71	73	72	71	71	71
27	69	70	71	73	72	71	71	71
28	69	70	71	73	72	71	71	71
29	69	70	71	73	72	72	71	71
30	69	70	71	73	72	72	72	72
31	69	70	71	73	72	72	72	72
32	69	70	71	73	72	72	72	73
33	69	70	71	73	72	72	72	73
34	69	70	71	73	73	72	73	74
35	69	70	71	73	73	72	73	74
36	69	70	71	73	73	73	73	75
37	69	70	71	73	73	73	74	75
38	69	70	71	73	73	73	74	76
39	69	70	71	73	73	73	75	76
40	69	70	71	73	73	73	75	77
41	69	70	72	73	73	74	75	78
42	69	70	72	73	74	74	76	78
43	69	70	72	73	74	74	76	79
44	69	70	72	73	74	74	77	80
45	69	70	72	73	74	75	77	80
46	69	70	72	73	74	75	78	81

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Bare #8 TC No. 57 (°F)	Conduit #4 Bare #8 TC No. 58 (°F)	Conduit #4 Bare #8 TC No. 59 (°F)	Conduit #4 Bare #8 TC No. 60 (°F)	Conduit #6 Bare #8 TC No. 61 (°F)	Conduit #6 Bare #8 TC No. 62 (°F)	Conduit #6 Bare #8 TC No. 63 (°F)	Conduit #6 Bare #8 TC No. 64 (°F)
47	69	70	72	73	74	75	79	82
48	69	70	72	73	75	75	79	83
49	69	70	72	73	75	76	80	83
50	69	70	72	73	75	76	80	84
51	70	70	72	73	75	76	81	85
52	70	70	72	73	75	77	81	86
53	70	71	72	73	76	77	82	86
54	70	71	72	73	76	77	83	87
55	70	71	72	73	76	78	83	88
56	70	71	72	73	76	78	84	89
57	70	71	72	73	77	78	84	90
58	70	71	72	73	77	79	85	91
59	71	71	72	74	77	79	86	91
60	71	71	72	74	77	79	86	92
61	71	71	72	74	78	80	87	93
62	71	71	72	74	78	80	87	94
63	71	72	72	74	78	80	88	95
64	72	72	73	74	78	81	89	96
65	72	72	73	74	79	81	90	97
66	72	72	73	74	79	82	90	98
67	72	72	73	74	79	82	91	99
68	73	72	73	74	80	83	92	100
69	73	73	73	74	80	83	93	101
70	74	73	73	74	80	83	93	103
71	74	73	73	74	81	84	94	104
72	74	73	74	74	81	84	95	105
73	75	74	74	74	81	85	96	107
74	75	74	74	75	82	85	97	108
75	76	74	74	75	82	86	98	110
76	76	74	74	75	82	87	99	111
77	76	75	75	75	83	87	100	113
78	77	75	75	75	83	88	101	114
79	77	75	75	75	83	88	102	116
80	78	76	75	75	84	89	103	118
81	78	76	75	75	84	89	104	119
82	79	76	76	76	85	90	105	120
83	80	77	76	76	85	91	106	122
84	80	77	76	76	86	91	107	124
85	81	78	76	76	86	92	108	125
86	81	78	77	76	86	92	109	126
87	82	78	77	76	87	93	111	127
88	82	79	77	77	87	94	111	129
89	83	79	77	77	88	94	113	130
90	84	79	78	77	88	95	113	132
91	84	80	78	77	89	95	115	133
92	85	80	78	77	89	96	116	134
93	85	81	78	78	90	97	116	135

OMEGA POINT LABORATORIES

PCI/Promatec Project No. 8610-102570 March 19, 1998

Time (min)	Conduit #4 Bare #8 TC No. 57 (°F)	Conduit #4 Bare #8 TC No. 58 (°F)	Conduit #4 Bare #8 TC No. 59 (°F)	Conduit #4 Bare #8 TC No. 60 (°F)	Conduit #6 Bare #8 TC No. 61 (°F)	Conduit #6 Bare #8 TC No. 62 (°F)	Conduit #6 Bare #8 TC No. 63 (°F)	Conduit #6 Bare #8 TC No. 64 (°F)
94	86	81	79	78	90	97	117	137
95	87	82	79	78	91	98	118	137
96	87	82	79	78	91	98	119	139
97	88	82	80	78	91	99	120	139
98	89	83	80	79	92	100	121	141
99	89	83	80	79	92	100	121	141
100	90	84	81	79	93	101	122	142
101	91	84	81	79	93	101	123	143
102	91	85	81	79	94	102	123	143
103	92	86	82	80	94	102	124	144
104	93	86	82	80	95	103	125	145
105	93	86	82	80	95	103	125	146
106	94	87	83	81	95	104	126	147
107	95	87	83	81	96	104	127	147
108	96	88	83	81	96	105	128	148
109	97	88	84	81	97	106	128	149
110	97	89	84	82	97	106	129	149
111	98	89	85	82	98	107	130	150
112	99	90	85	82	98	107	130	151
113	100	91	85	83	98	108	131	151
114	101	91	86	83	99	108	132	152
115	101	92	86	83	99	109	132	153
116	102	92	87	83	100	109	133	154
117	103	93	87	84	100	110	134	155
118	104	94	87	84	101	110	135	155
119	105	94	88	85	101	111	135	156
120	106	95	89	85	102	112	136	157
121	106	95	89	85	102	112	137	157
122	107	96	90	85	102	113	137	158
123	108	97	90	86	103	113	138	158
124	109	98	91	86	103	114	139	159
125	110	98	91	87	104	114	139	160
126	111	99	92	87	104	115	140	161
127	112	100	93	88	105	115	141	161
128	114	101	93	88	105	116	141	162
129	117	102	94	88	106	116	142	162
130	119	104	96	90	106	117	142	163
131	123	105	96	90	107	117	143	164
132	125	107	97	91	107	118	143	164
133	127	108	99	92	108	118	144	165
134	129	110	101	94	108	119	145	165
135	132	112	102	93	109	119	145	166
136	134	114	103	95	109	120	146	167
137	137	114	104	96	110	121	146	167
138	139	117	107	97	110	121	147	168
139	140	118	107	99	111	122	148	169
140	142	120	109	100	111	122	148	169

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Bare #8 TC No. 57 (°F)	Conduit #4 Bare #8 TC No. 58 (°F)	Conduit #4 Bare #8 TC No. 59 (°F)	Conduit #4 Bare #8 TC No. 60 (°F)	Conduit #6 Bare #8 TC No. 61 (°F)	Conduit #6 Bare #8 TC No. 62 (°F)	Conduit #6 Bare #8 TC No. 63 (°F)	Conduit #6 Bare #8 TC No. 64 (°F)
141	143	122	111	101	112	123	149	170
142	145	124	111	102	112	124	150	170
143	146	124	112	102	113	124	150	171
144	148	125	114	103	114	125	151	172
145	150	127	116	104	115	126	151	172
146	151	128	116	106	116	126	152	173
147	152	130	118	108	117	127	152	173
148	154	130	120	108	117	128	153	174
149	155	133	121	108	119	129	154	174
150	155	133	123	110	120	130	154	175
151	157	135	125	112	121	132	157	175
152	158	136	124	112	123	133	157	176
153	159	138	124	114	124	135	158	176
154	160	138	128	115	125	136	161	177
155	161	139	127	115	127	138	163	178
156	163	141	129	116	129	140	167	179
157	163	141	129	119	130	142	168	180
158	166	142	131	118	133	145	170	181
159	166	145	131	119	134	146	173	182
160	167	145	137	122	136	148	172	182
161	169	146	134	122	138	149	172	183
162	170	147	136	124	140	152	176	183
163	170	149	137	125	142	153	177	185
164	172	149	138	126	145	155	178	185
165	173	151	140	126	147	157	178	184
166	173	152	143	127	148	160	180	184
167	174	153	140	127	151	161	182	188
168	174	152	144	134	152	163	183	189
169	175	153	142	130	154	164	184	190
170	176	155	143	131	156	166	183	188
171	177	156	146	134	157	167	186	190
172	178	156	147	135	159	169	187	192
173	179	160	148	135	161	170	188	191
174	179	157	151	137	163	171	189	193
175	180	159	153	139	162	171	189	193
176	181	161	152	139	164	172	188	192
177	181	164	152	140	165	173	188	193
178	181	162	154	140	166	174	191	195
179	183	163	154	143	167	175	192	195
180	184	164	156	143	169	176	192	196

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Bare #8 TC No. 65 (°F)	Conduit #6 Bare #8 TC No. 66 (°F)	Conduit #6 Bare #8 TC No. 67 (°F)	Conduit #6 Bare #8 TC No. 68 (°F)	Conduit #6 Bare #8 TC No. 69 (°F)	Conduit #6 Bare #8 TC No. 70 (°F)	Conduit #6 Bare #8 TC No. 71 (°F)	Conduit #6 Bare #8 TC No. 72 (°F)
0	67	67	67	66	66	66	66	66
1	67	67	67	66	66	66	66	66
2	67	67	67	66	66	66	66	66
3	67	67	67	66	66	66	66	66
4	68	67	67	66	66	66	66	66
5	68	67	67	66	66	66	66	66
6	68	67	67	67	66	66	66	66
7	68	67	67	67	66	66	66	66
8	68	67	67	67	66	66	66	66
9	68	67	67	67	66	66	66	66
10	68	67	67	67	66	66	66	66
11	68	67	67	67	66	66	66	66
12	68	67	67	67	66	66	66	67
13	68	67	67	67	66	66	67	67
14	68	67	67	67	67	66	67	67
15	68	68	67	67	67	66	67	68
16	68	68	67	67	67	67	68	69
17	68	68	67	67	67	67	69	70
18	68	68	67	67	67	67	69	71
19	68	68	67	67	68	67	70	72
20	69	68	67	67	68	67	71	73
21	69	68	67	67	68	67	72	73
22	69	68	67	67	69	67	73	74
23	69	68	68	67	69	68	74	75
24	69	68	68	67	70	68	75	76
25	69	69	68	68	70	68	75	77
26	70	69	68	68	71	69	76	78
27	70	69	68	68	71	69	77	78
28	70	69	68	68	72	69	78	79
29	71	70	68	68	73	69	78	80
30	71	70	69	69	73	70	79	80
31	71	70	69	69	74	70	80	81
32	72	70	69	69	74	70	81	82
33	72	71	69	69	75	71	81	82
34	73	71	70	70	75	71	82	83
35	73	72	70	70	76	72	83	84
36	73	72	70	70	76	72	83	84
37	74	72	71	71	77	72	84	85
38	75	73	71	71	78	73	85	85
39	75	73	72	71	78	73	85	86
40	76	74	72	72	79	74	86	87
41	76	75	72	72	79	74	87	87
42	77	75	73	73	80	75	87	88
43	78	76	73	73	80	75	88	89
44	78	76	74	74	81	76	88	89
45	79	77	75	74	82	76	89	90
46	80	78	75	75	82	77	90	91

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Bare #8 TC No. 65 (°F)	Conduit #6 Bare #8 TC No. 66 (°F)	Conduit #6 Bare #8 TC No. 67 (°F)	Conduit #6 Bare #8 TC No. 68 (°F)	Conduit #6 Bare #8 TC No. 69 (°F)	Conduit #6 Bare #8 TC No. 70 (°F)	Conduit #6 Bare #8 TC No. 71 (°F)	Conduit #6 Bare #8 TC No. 72 (°F)
47	81	78	76	75	83	78	91	91
48	82	79	76	76	84	78	91	92
49	82	80	77	77	84	79	92	93
50	83	81	78	77	85	79	93	94
51	84	82	78	78	86	80	94	95
52	85	82	79	79	87	81	95	96
53	86	83	80	79	87	81	95	97
54	87	84	81	80	88	82	96	98
55	88	85	81	81	89	83	97	99
56	88	86	82	82	90	84	98	99
57	89	87	83	82	90	84	99	100
58	90	87	84	83	91	85	100	101
59	91	88	85	84	92	86	101	102
60	92	89	85	85	93	87	101	103
61	93	90	86	85	94	88	102	104
62	94	91	87	86	94	88	103	105
63	95	92	88	87	95	89	104	106
64	96	93	89	88	96	90	105	107
65	97	94	90	89	97	91	106	108
66	98	95	91	90	98	92	107	109
67	99	96	92	91	99	93	108	110
68	101	97	93	92	100	93	109	111
69	102	99	94	93	101	94	110	112
70	103	100	95	93	101	95	111	113
71	105	101	96	94	102	96	112	114
72	106	102	97	95	103	97	113	115
73	108	104	98	96	104	98	114	116
74	109	105	99	97	105	99	115	117
75	111	107	100	99	106	100	116	118
76	113	109	102	100	107	101	117	119
77	115	110	103	101	108	102	118	120
78	117	112	104	102	109	103	118	121
79	119	114	106	103	110	104	119	122
80	121	116	107	104	111	105	120	123
81	123	118	109	106	112	106	121	124
82	125	120	111	107	113	107	122	125
83	127	122	112	108	114	108	123	126
84	128	124	114	110	115	110	124	127
85	130	126	116	111	116	111	125	128
86	132	128	118	113	117	112	126	129
87	134	130	120	114	118	113	127	130
88	136	133	122	116	119	115	128	131
89	138	135	125	118	120	116	129	132
90	140	137	127	120	122	117	130	133
91	141	139	129	121	123	119	131	134
92	143	141	131	123	124	120	132	135
93	144	143	134	126	125	122	133	136

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Bare #8 TC No. 65 (°F)	Conduit #6 Bare #8 TC No. 66 (°F)	Conduit #6 Bare #8 TC No. 67 (°F)	Conduit #6 Bare #8 TC No. 68 (°F)	Conduit #6 Bare #8 TC No. 69 (°F)	Conduit #6 Bare #8 TC No. 70 (°F)	Conduit #6 Bare #8 TC No. 71 (°F)	Conduit #6 Bare #8 TC No. 72 (°F)
94	146	145	136	128	126	123	134	138
95	147	147	138	130	128	125	135	139
96	148	149	141	133	129	127	136	140
97	150	150	143	135	130	129	137	141
98	151	152	145	138	132	131	138	142
99	152	153	147	141	133	133	140	143
100	153	155	149	144	135	136	141	144
101	154	156	151	146	137	138	142	145
102	155	157	153	149	139	141	144	147
103	156	158	155	151	141	143	145	148
104	156	159	157	154	143	146	146	149
105	157	160	158	156	145	148	148	151
106	158	161	160	158	148	151	150	152
107	159	162	161	160	150	153	151	154
108	159	163	162	162	152	156	153	155
109	160	164	164	163	155	158	155	157
110	161	165	165	165	157	160	157	158
111	161	166	166	166	160	162	159	160
112	162	167	167	168	162	164	161	162
113	163	167	168	169	164	166	163	164
114	164	168	169	170	166	168	165	165
115	164	169	170	172	168	169	167	167
116	165	170	171	173	170	171	168	169
117	166	171	172	174	171	172	170	170
118	167	171	173	175	173	173	172	172
119	167	172	174	176	174	175	174	174
120	168	173	174	176	176	176	175	175
121	169	174	175	177	177	177	177	177
122	169	174	176	178	178	178	178	179
123	170	175	177	179	180	179	180	180
124	171	176	177	180	181	180	181	182
125	171	176	178	181	182	181	182	183
126	172	177	179	181	183	182	184	184
127	173	178	180	182	184	183	185	186
128	173	178	180	183	185	184	186	187
129	174	179	181	184	186	185	187	188
130	175	180	182	185	187	186	188	189
131	175	180	183	185	188	186	189	190
132	176	181	183	186	189	187	190	191
133	176	182	184	187	190	188	191	192
134	177	182	185	188	191	189	192	193
135	178	183	186	188	192	190	193	194
136	178	184	186	189	193	191	194	194
137	179	184	187	190	193	191	194	195
138	180	185	188	191	194	192	195	196
139	180	186	189	192	195	193	196	197
140	181	187	189	192	196	194	197	198

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Bare #8 TC No. 65 (°F)	Conduit #6 Bare #8 TC No. 66 (°F)	Conduit #6 Bare #8 TC No. 67 (°F)	Conduit #6 Bare #8 TC No. 68 (°F)	Conduit #6 Bare #8 TC No. 69 (°F)	Conduit #6 Bare #8 TC No. 70 (°F)	Conduit #6 Bare #8 TC No. 71 (°F)	Conduit #6 Bare #8 TC No. 72 (°F)
141	182	187	190	193	196	194	197	198
142	182	188	191	194	197	195	198	199
143	183	189	192	194	198	196	199	200
144	184	189	192	195	198	197	200	200
145	184	190	193	196	199	197	200	201
146	185	191	194	196	199	198	201	202
147	185	191	194	197	200	198	201	202
148	186	192	195	197	200	199	202	203
149	187	192	195	198	201	199	203	203
150	187	193	196	199	201	200	203	204
151	187	194	196	199	202	200	204	205
152	188	194	197	200	203	201	204	205
153	188	194	197	200	203	201	205	206
154	189	195	198	200	203	202	205	206
155	189	195	198	201	204	202	206	207
156	189	195	199	201	204	203	206	208
157	190	195	199	202	205	203	207	208
158	190	196	199	202	205	204	208	209
159	190	196	199	203	206	204	208	209
160	190	195	199	203	206	204	209	210
161	190	195	200	203	207	205	209	211
162	190	196	200	204	207	205	210	211
163	191	196	200	204	208	206	210	212
164	191	196	200	204	208	206	211	212
165	191	196	200	204	209	206	211	213
166	191	196	200	205	209	207	212	214
167	192	196	201	205	210	207	212	214
168	192	197	201	205	210	207	213	215
169	193	197	201	205	210	208	213	215
170	193	197	201	206	211	208	214	216
171	194	198	202	206	211	208	214	217
172	195	198	202	206	212	209	215	217
173	194	198	202	206	212	209	215	218
174	196	199	203	206	212	209	216	218
175	196	200	203	207	213	209	216	219
176	196	200	203	207	213	210	217	219
177	196	199	203	207	214	210	217	220
178	197	199	201	207	214	210	218	220
179	199	200	201	204	214	210	218	221
180	198	200	201	208	215	210	219	222

Time (min)	Conduit #6 Bare #8 TC No. 73 (°F)	Conduit #6 Bare #8 TC No. 74 (°F)	Conduit #6 Bare #8 TC No. 75 (°F)	Conduit #6 Bare #8 TC No. 76 (°F)	Conduit #6 Bare #8 TC No. 77 (°F)	Conduit #6 Bare #8 TC No. 78 (°F)	Conduit #6 Bare #8 TC No. 79 (°F)	Conduit #6 Bare #8 TC No. 80 (°F)
0	66	66	66	66	66	66	66	66
1	66	66	66	66	66	66	66	66
2	66	66	66	66	66	66	66	66
3	66	66	66	66	66	66	66	66
4	66	66	66	66	66	66	66	66
5	66	66	66	66	66	66	66	66
6	66	66	66	66	66	66	66	66
7	66	66	66	66	66	66	66	66
8	66	66	66	66	66	66	66	66
9	66	66	66	66	66	66	66	66
10	66	66	66	66	66	66	66	66
11	66	66	66	66	66	66	66	66
12	66	66	66	66	66	66	66	66
13	66	66	66	66	66	66	66	66
14	67	66	66	66	66	66	66	66
15	67	66	66	66	66	66	66	66
16	67	66	66	66	66	66	66	66
17	68	66	66	66	66	66	66	66
18	68	67	66	66	66	66	66	66
19	69	67	66	66	66	66	66	66
20	69	67	67	66	66	66	66	66
21	70	68	67	66	66	66	66	66
22	71	68	67	67	66	66	66	66
23	71	68	67	67	66	66	66	66
24	72	69	67	67	66	66	66	66
25	72	69	68	67	67	66	66	66
26	73	69	68	67	67	66	66	66
27	73	70	68	67	67	66	66	66
28	74	70	68	68	67	66	66	66
29	74	70	69	68	67	66	66	66
30	75	71	69	68	67	67	66	66
31	75	71	69	69	68	67	66	66
32	76	72	70	69	68	67	66	66
33	76	72	70	69	68	67	66	66
34	77	72	70	70	69	67	66	66
35	77	73	71	70	69	67	67	66
36	78	73	71	70	69	68	67	66
37	78	74	72	71	70	68	67	66
38	79	74	72	72	70	68	67	66
39	80	75	73	72	71	69	67	67
40	80	75	73	73	72	69	67	67
41	81	76	74	74	73	70	68	67
42	81	76	74	75	74	70	68	67
43	82	77	75	76	75	71	69	67
44	82	77	76	77	76	72	69	68
45	83	78	77	78	77	73	69	68
46	84	79	77	80	79	74	70	68

OMEGA POINT LABORATORIES

PCI/Promatec Project No. 8610-102570 March 19, 1998

Time (min)	Conduit #6 Bare #8 TC No. 73 (°F)	Conduit #6 Bare #8 TC No. 74 (°F)	Conduit #6 Bare #8 TC No. 75 (°F)	Conduit #6 Bare #8 TC No. 76 (°F)	Conduit #6 Bare #8 TC No. 77 (°F)	Conduit #6 Bare #8 TC No. 78 (°F)	Conduit #6 Bare #8 TC No. 79 (°F)	Conduit #6 Bare #8 TC No. 80 (°F)
47	84	79	78	81	80	75	71	69
48	85	80	79	82	82	76	71	69
49	86	81	80	83	83	77	72	70
50	87	82	81	85	84	78	73	70
51	88	82	82	86	86	79	73	71
52	88	83	83	87	87	80	74	71
53	89	84	84	88	89	81	75	72
54	90	85	85	90	90	82	76	72
55	91	86	86	91	91	83	77	73
56	92	87	87	92	93	84	78	73
57	93	88	88	93	94	86	78	74
58	94	89	89	94	95	87	79	75
59	95	89	90	96	96	88	80	76
60	95	90	91	97	98	89	81	76
61	96	91	92	98	99	90	82	77
62	97	92	93	99	100	91	83	78
63	98	93	94	100	101	92	84	78
64	99	94	95	101	102	93	84	79
65	100	95	96	102	103	94	85	80
66	101	96	97	103	104	95	86	81
67	102	97	98	104	105	96	87	81
68	104	98	99	105	106	97	88	82
69	105	99	100	106	107	98	89	83
70	106	100	101	107	108	98	90	84
71	107	101	102	108	109	99	91	84
72	108	102	103	109	110	100	91	85
73	109	104	104	110	111	101	92	86
74	110	105	105	111	111	102	93	87
75	111	106	106	112	112	103	94	88
76	112	107	107	113	113	104	95	89
77	113	108	108	114	114	105	96	89
78	114	109	109	115	115	106	97	90
79	115	110	110	116	116	107	98	91
80	116	111	111	117	118	108	99	92
81	117	112	112	118	119	109	100	93
82	118	113	114	119	120	110	100	94
83	119	114	115	120	121	111	101	95
84	120	115	116	121	122	112	102	96
85	122	116	117	122	123	113	103	96
86	123	117	118	124	124	114	104	97
87	124	119	119	125	125	115	105	98
88	125	120	120	126	126	116	106	99
89	126	121	121	127	127	117	107	100
90	127	122	123	128	128	118	108	101
91	128	123	124	129	129	119	109	102
92	129	124	125	130	130	120	110	103
93	130	125	126	131	131	121	111	104

OMEGA POINT LABORATORIES

PCI/Promatec Project No. 8610-102570 March 19, 1998

Time (min)	Conduit #6 Bare #8 TC No. 73 (°F)	Conduit #6 Bare #8 TC No. 74 (°F)	Conduit #6 Bare #8 TC No. 75 (°F)	Conduit #6 Bare #8 TC No. 76 (°F)	Conduit #6 Bare #8 TC No. 77 (°F)	Conduit #6 Bare #8 TC No. 78 (°F)	Conduit #6 Bare #8 TC No. 79 (°F)	Conduit #6 Bare #8 TC No. 80 (°F)
94	131	127	127	133	132	122	112	105
95	133	128	128	134	133	123	113	106
96	134	129	130	135	134	124	114	107
97	135	130	131	136	136	125	115	108
98	136	131	132	137	137	126	116	109
99	137	133	133	138	138	127	117	110
100	139	134	134	140	139	128	118	111
101	140	135	136	141	140	130	119	112
102	141	136	137	142	141	131	120	113
103	142	138	138	143	142	132	121	114
104	144	139	139	145	143	133	122	115
105	145	140	141	146	145	134	124	116
106	146	142	142	147	146	135	125	117
107	148	143	143	148	147	136	126	118
108	149	144	145	150	148	137	127	119
109	150	146	146	151	149	139	128	120
110	152	147	147	152	151	140	129	121
111	153	149	149	154	152	141	130	123
112	155	150	150	155	153	142	131	124
113	156	151	152	156	154	143	133	125
114	158	153	153	158	155	144	134	126
115	160	154	154	159	157	146	135	127
116	161	156	156	160	158	147	136	129
117	163	157	157	161	159	148	137	130
118	165	159	159	163	160	149	138	131
119	167	161	160	164	161	150	140	133
120	168	162	162	165	163	152	141	134
121	170	164	163	167	164	153	142	135
122	172	166	165	168	165	154	143	137
123	174	167	166	169	166	155	145	138
124	176	169	168	170	167	157	146	140
125	177	171	169	172	169	158	147	141
126	179	172	170	173	170	159	149	143
127	180	174	172	174	171	160	150	144
128	182	175	173	176	172	162	151	146
129	183	177	175	177	173	163	153	147
130	185	178	176	178	175	164	154	149
131	186	180	178	179	176	165	155	150
132	187	181	179	181	177	167	157	151
133	188	182	180	182	178	168	158	153
134	189	184	182	183	179	169	159	154
135	190	185	183	184	180	170	161	156
136	191	186	184	185	181	171	162	157
137	192	187	185	186	182	172	163	159
138	193	188	186	187	183	174	165	160
139	194	189	187	188	184	175	166	162
140	195	190	188	189	185	176	167	163

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Bare #8 TC No. 73 (°F)	Conduit #6 Bare #8 TC No. 74 (°F)	Conduit #6 Bare #8 TC No. 75 (°F)	Conduit #6 Bare #8 TC No. 76 (°F)	Conduit #6 Bare #8 TC No. 77 (°F)	Conduit #6 Bare #8 TC No. 78 (°F)	Conduit #6 Bare #8 TC No. 79 (°F)	Conduit #6 Bare #8 TC No. 80 (°F)
141	196	191	189	190	186	177	169	164
142	196	192	190	191	187	178	170	166
143	197	193	191	192	188	179	171	167
144	198	194	192	193	189	180	173	169
145	199	195	193	193	190	181	174	170
146	199	196	194	194	191	183	175	171
147	200	197	195	195	191	184	176	173
148	201	198	196	196	192	185	178	174
149	202	198	197	197	193	186	179	175
150	202	199	198	197	194	187	180	177
151	203	200	198	198	195	188	181	178
152	204	201	199	199	196	189	182	179
153	204	202	200	200	197	190	183	180
154	205	202	201	201	197	191	184	181
155	206	203	202	201	198	192	186	182
156	206	204	203	202	199	193	187	184
157	207	205	203	203	200	194	188	185
158	208	205	204	204	201	195	189	186
159	208	206	205	204	202	196	190	187
160	209	207	206	205	202	197	191	188
161	210	208	207	206	203	198	192	189
162	210	208	207	207	204	199	193	190
163	211	209	208	207	205	200	194	191
164	212	210	209	208	206	201	195	192
165	212	211	210	209	207	202	196	193
166	213	212	211	210	208	202	197	194
167	214	212	211	211	208	203	198	195
168	214	213	212	211	209	204	199	195
169	215	214	213	212	210	205	200	196
170	216	214	214	213	211	206	200	197
171	216	215	214	214	212	207	200	198
172	217	216	215	214	213	207	200	198
173	217	217	216	215	213	207	199	199
174	218	217	217	216	214	206	200	199
175	219	218	218	217	215	205	200	200
176	219	219	219	218	214	203	200	200
177	220	220	219	218	214	202	201	201
178	221	221	220	219	210	202	201	201
179	221	221	221	219	208	203	201	201
180	222	222	222	219	208	203	202	202

OMEGA POINT LABORATORIES

PCI/Promatec Project No. 8610-102570 March 19, 1998

Time (min)	Conduit #6 Bare #8 TC No. 81 (°F)	Conduit #6 Bare #8 TC No. 82 (°F)	Conduit #6 Bare #8 TC No. 83 (°F)	Conduit #6 Bare #8 TC No. 84 (°F)	Conduit #6 Bare #8 TC No. 85 (°F)	Conduit #6 Bare #8 TC No. 86 (°F)	Conduit #6 Bare #8 TC No. 87 (°F)	Conduit #6 Bare #8 TC No. 88 (°F)
0	66	66	66	66	66	67	67	67
1	66	66	66	66	66	67	67	67
2	66	66	66	66	66	67	67	67
3	66	66	66	66	66	67	67	67
4	66	66	66	66	66	67	67	67
5	66	66	66	66	66	67	67	67
6	66	66	66	66	66	67	67	67
7	66	66	66	66	66	67	67	67
8	66	66	66	66	66	67	67	67
9	66	66	66	66	66	67	67	67
10	66	66	66	66	66	67	67	67
11	66	66	66	66	66	67	67	67
12	66	66	66	66	66	67	67	67
13	66	66	66	66	67	67	67	67
14	66	66	66	66	66	67	67	67
15	66	66	66	66	66	67	67	67
16	66	66	66	66	66	67	67	67
17	66	66	66	66	66	67	67	67
18	66	66	66	66	67	67	67	67
19	66	66	66	66	66	67	67	67
20	66	66	66	66	66	67	67	67
21	66	66	66	66	67	67	67	67
22	66	66	66	66	66	67	67	67
23	66	66	66	66	67	67	67	67
24	66	66	66	66	67	67	67	67
25	66	66	66	66	66	67	67	67
26	66	66	66	66	67	67	67	67
27	66	66	66	66	67	67	67	67
28	66	66	66	66	67	67	67	67
29	66	66	66	66	67	67	67	67
30	66	66	66	66	67	67	67	68
31	66	66	66	67	67	67	67	68
32	66	66	66	67	67	67	67	68
33	66	66	67	67	67	67	67	68
34	66	66	67	67	67	67	67	68
35	67	67	67	67	67	67	67	68
36	67	67	67	67	67	67	67	68
37	67	67	67	67	67	67	67	68
38	67	67	67	67	67	67	67	68
39	67	67	67	67	67	67	68	68
40	67	67	67	67	67	67	68	68
41	67	67	67	67	67	67	68	68
42	67	67	67	67	67	67	68	68
43	67	67	67	67	67	67	68	68
44	68	68	67	67	67	68	68	69
45	68	68	68	68	68	68	68	69
46	68	68	68	68	68	68	68	69

OMEGA POINT LABORATORIES

PCI/Promatec Project No. 8610-102570 March 19, 1998

Time (min)	Conduit #6 Bare #8 TC No. 81 (°F)	Conduit #6 Bare #8 TC No. 82 (°F)	Conduit #6 Bare #8 TC No. 83 (°F)	Conduit #6 Bare #8 TC No. 84 (°F)	Conduit #6 Bare #8 TC No. 85 (°F)	Conduit #6 Bare #8 TC No. 86 (°F)	Conduit #6 Bare #8 TC No. 87 (°F)	Conduit #6 Bare #8 TC No. 88 (°F)
47	68	68	68	68	68	68	68	69
48	69	69	68	68	68	68	68	69
49	69	69	68	68	68	68	69	69
50	69	69	69	68	68	68	69	69
51	70	69	69	69	69	69	69	70
52	70	70	69	69	69	69	69	70
53	71	70	69	69	69	69	69	70
54	71	71	70	69	69	69	70	70
55	72	71	70	70	70	70	70	71
56	72	72	71	70	70	70	70	71
57	73	72	71	70	70	70	70	71
58	73	73	71	71	70	70	71	72
59	74	73	72	71	71	71	71	72
60	74	74	72	71	71	71	71	72
61	75	74	73	72	71	71	72	73
62	76	75	73	72	72	72	72	73
63	76	75	74	73	72	72	72	74
64	77	76	74	73	73	73	73	74
65	78	76	75	74	73	73	73	74
66	78	77	75	74	74	73	74	75
67	79	78	76	75	74	74	74	75
68	80	78	76	75	75	75	75	76
69	80	79	77	76	75	75	75	77
70	81	80	78	77	76	76	76	77
71	82	80	78	77	77	76	76	78
72	82	81	79	78	77	77	77	78
73	83	82	80	79	78	77	78	79
74	84	83	80	79	78	78	78	80
75	85	83	81	80	79	79	79	80
76	85	84	82	81	80	79	80	81
77	86	85	83	81	81	80	80	82
78	87	86	83	82	81	81	81	82
79	88	86	84	83	82	82	82	83
80	89	87	85	84	83	82	83	84
81	90	88	86	85	84	83	83	85
82	90	89	87	85	84	84	84	85
83	91	90	87	86	85	85	85	86
84	92	91	88	87	86	86	86	87
85	93	91	89	88	87	87	87	88
86	94	92	90	89	88	87	88	89
87	95	93	91	90	89	88	88	90
88	96	94	92	90	90	89	89	90
89	97	95	93	91	91	90	90	91
90	98	96	94	92	92	91	91	92
91	99	97	94	93	92	92	92	93
92	99	98	95	94	93	93	93	94
93	100	99	96	95	94	94	94	95

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Bare #8 TC No. 81 (°F)	Conduit #6 Bare #8 TC No. 82 (°F)	Conduit #6 Bare #8 TC No. 83 (°F)	Conduit #6 Bare #8 TC No. 84 (°F)	Conduit #6 Bare #8 TC No. 85 (°F)	Conduit #6 Bare #8 TC No. 86 (°F)	Conduit #6 Bare #8 TC No. 87 (°F)	Conduit #6 Bare #8 TC No. 88 (°F)
94	101	100	97	96	95	95	95	95
95	102	100	98	97	96	96	95	96
96	103	101	99	98	97	97	96	97
97	104	102	100	99	98	98	97	98
98	105	103	101	100	99	99	98	99
99	106	104	102	101	100	100	99	100
100	107	105	103	102	101	101	100	101
101	108	106	104	103	102	102	101	102
102	109	107	105	104	103	103	102	103
103	110	108	106	105	104	104	103	104
104	111	109	107	106	105	105	104	105
105	112	110	108	107	106	106	105	106
106	113	112	109	108	108	107	106	107
107	114	113	110	109	109	108	107	108
108	115	114	112	111	110	109	108	109
109	117	115	113	112	111	110	109	110
110	118	116	114	113	112	111	110	111
111	119	117	116	115	113	112	111	112
112	120	119	117	116	114	113	112	113
113	121	120	118	117	116	114	114	114
114	123	122	120	119	117	116	115	115
115	124	124	121	120	118	117	116	116
116	126	125	122	121	119	118	117	117
117	127	127	124	123	121	119	118	118
118	129	129	125	124	122	120	119	119
119	130	131	127	125	123	121	120	120
120	132	133	128	127	124	122	121	121
121	134	134	130	128	125	124	122	122
122	135	136	131	130	127	125	123	123
123	137	137	133	131	128	126	125	124
124	138	139	134	132	129	127	126	125
125	140	141	136	134	131	129	127	127
126	141	142	138	135	132	130	128	128
127	143	144	139	137	133	131	129	129
128	144	146	141	139	135	132	131	130
129	146	147	143	140	136	134	132	132
130	148	149	144	142	138	135	133	133
131	149	151	146	144	139	136	135	134
132	151	152	148	145	141	138	136	136
133	152	154	149	147	142	139	138	137
134	154	155	151	148	144	141	139	139
135	155	157	152	150	146	143	141	141
136	156	158	154	152	147	144	142	142
137	158	160	155	153	149	145	144	144
138	160	161	157	155	150	147	146	145
139	161	163	159	157	152	149	147	147
140	163	165	160	158	154	151	149	148

OMEGA POINT LABORATORIES

PCI/Promatec Project No. 8610-102570 March 19, 1998

Time (min)	Conduit #6 Bare #8 TC No. 81 (°F)	Conduit #6 Bare #8 TC No. 82 (°F)	Conduit #6 Bare #8 TC No. 83 (°F)	Conduit #6 Bare #8 TC No. 84 (°F)	Conduit #6 Bare #8 TC No. 85 (°F)	Conduit #6 Bare #8 TC No. 86 (°F)	Conduit #6 Bare #8 TC No. 87 (°F)	Conduit #6 Bare #8 TC No. 88 (°F)
141	164	166	162	160	157	152	150	150
142	165	167	164	162	157	154	152	152
143	167	169	165	163	159	155	153	153
144	168	170	167	165	160	157	155	155
145	170	172	168	166	162	158	157	156
146	171	173	170	168	164	160	159	157
147	172	174	171	169	165	162	159	158
148	174	176	173	171	166	163	161	160
149	175	177	174	172	168	164	162	161
150	176	178	176	174	169	166	164	163
151	178	179	177	175	171	168	165	164
152	179	180	178	176	172	169	165	166
153	180	182	180	178	175	169	167	166
154	181	183	181	179	176	171	169	168
155	182	184	182	181	178	173	170	169
156	183	185	183	182	178	175	172	170
157	185	186	185	183	179	175	173	173
158	186	188	186	185	182	177	176	175
159	187	189	187	186	183	177	175	176
160	188	190	189	187	184	179	176	177
161	189	191	190	188	184	180	178	178
162	190	192	191	190	186	181	179	179
163	191	193	192	191	187	182	180	180
164	192	194	193	191	189	183	182	181
165	193	194	194	193	190	185	183	182
166	194	195	195	194	191	186	183	182
167	195	196	196	194	192	187	183	184
168	195	197	196	195	193	189	186	184
169	196	198	197	196	195	189	187	186
170	197	198	198	197	196	190	188	186
171	198	199	199	198	197	191	189	188
172	199	200	200	199	198	193	190	188
173	199	200	200	199	199	193	190	189
174	200	201	201	200	199	194	190	189
175	200	201	201	201	200	194	192	189
176	201	201	202	201	200	195	193	190
177	201	202	202	202	201	197	191	190
178	201	202	203	202	201	197	194	192
179	202	203	203	202	202	197	195	191
180	202	203	203	203	202	197	194	193

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Bare #8 TC No. 89 (°F)	Conduit #6 Bare #8 TC No. 90 (°F)	Conduit #1 Bare #8 TC No. 91 (°F)	Conduit #1 Bare #8 TC No. 92 (°F)	Conduit #1 Bare #8 TC No. 93 (°F)	Conduit #1 Bare #8 TC No. 94 (°F)	Conduit #1 Bare #8 TC No. 95 (°F)	Conduit #1 Bare #8 TC No. 96 (°F)
0	68	69	69	69	68	68	67	67
1	68	69	69	69	68	68	67	67
2	68	69	69	69	68	68	67	67
3	68	69	69	69	68	68	67	67
4	68	69	69	69	68	68	67	67
5	68	69	69	69	68	68	67	67
6	68	69	69	69	68	68	67	67
7	68	69	69	69	68	68	67	67
8	68	69	70	69	68	68	67	67
9	68	69	70	69	68	68	67	67
10	68	69	70	69	68	68	67	67
11	68	69	70	69	68	68	67	67
12	68	69	70	69	68	68	67	67
13	68	69	70	69	68	68	67	67
14	68	69	70	69	68	68	67	67
15	68	69	70	69	68	68	67	67
16	68	69	70	69	68	68	67	67
17	68	69	70	69	68	68	67	67
18	68	69	70	69	68	68	67	67
19	68	69	70	69	68	68	67	67
20	68	69	70	69	68	68	67	67
21	68	69	70	69	68	68	67	68
22	68	69	70	69	68	68	68	68
23	68	69	70	69	68	68	68	68
24	68	69	70	69	69	68	68	68
25	68	69	70	70	69	68	68	68
26	68	69	70	70	69	68	68	69
27	68	69	70	70	69	68	68	69
28	68	69	71	70	69	69	68	69
29	68	69	71	70	70	69	69	70
30	68	70	71	71	70	69	69	70
31	68	70	71	71	70	69	69	70
32	68	70	71	71	70	70	69	71
33	69	70	72	72	71	70	70	71
34	69	70	72	72	71	70	70	72
35	69	70	72	73	72	71	70	72
36	69	70	73	73	72	71	71	73
37	69	70	73	74	73	71	71	73
38	69	70	73	74	73	72	72	74
39	69	71	74	75	74	72	72	74
40	69	71	74	76	75	73	73	75
41	69	71	75	77	75	73	73	76
42	69	71	75	77	76	74	74	76
43	70	71	76	78	77	75	74	77
44	70	71	77	79	78	75	75	78
45	70	71	77	80	79	76	76	78
46	70	72	78	81	80	77	76	79

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Bare #8 TC No. 89 (°F)	Conduit #6 Bare #8 TC No. 90 (°F)	Conduit #1 Bare #8 TC No. 91 (°F)	Conduit #1 Bare #8 TC No. 92 (°F)	Conduit #1 Bare #8 TC No. 93 (°F)	Conduit #1 Bare #8 TC No. 94 (°F)	Conduit #1 Bare #8 TC No. 95 (°F)	Conduit #1 Bare #8 TC No. 96 (°F)
47	70	72	79	83	81	78	77	80
48	70	72	80	84	82	79	78	81
49	71	72	81	85	83	80	79	82
50	71	72	82	86	84	81	80	83
51	71	72	82	87	85	82	80	84
52	71	73	83	88	86	83	81	85
53	71	73	84	90	88	84	82	86
54	72	73	85	91	89	85	83	87
55	72	73	86	92	90	86	84	88
56	72	74	87	94	92	87	85	89
57	73	74	88	95	93	88	86	90
58	73	74	89	96	94	89	87	91
59	73	75	90	98	96	91	88	92
60	74	75	91	99	97	92	89	93
61	74	75	92	100	98	93	90	94
62	74	76	93	102	100	94	92	95
63	75	76	94	103	101	95	93	96
64	75	76	96	105	102	96	94	97
65	76	77	97	106	104	98	95	98
66	76	77	98	108	105	99	96	99
67	77	77	99	109	107	100	97	100
68	77	78	100	111	109	102	98	101
69	77	78	102	113	110	103	99	102
70	78	79	103	114	112	104	100	103
71	79	79	104	116	114	106	101	104
72	79	80	106	118	116	108	103	105
73	80	80	107	120	118	109	104	106
74	80	81	108	122	120	111	105	107
75	81	81	110	124	122	112	106	108
76	82	82	111	126	124	114	108	109
77	82	82	113	128	127	116	109	110
78	83	83	114	130	129	118	110	111
79	84	84	116	131	131	120	112	113
80	84	84	117	133	134	123	113	114
81	85	85	118	135	136	125	115	115
82	86	85	119	136	138	127	117	116
83	86	86	121	138	140	130	119	117
84	87	86	122	140	143	132	121	119
85	88	87	123	141	145	135	123	120
86	89	88	124	142	147	137	125	121
87	89	88	125	144	149	140	127	123
88	90	89	126	145	151	142	130	124
89	91	90	128	146	152	145	132	126
90	91	90	129	148	154	147	135	128
91	92	91	130	149	156	150	138	129
92	93	91	131	150	157	152	140	131
93	94	92	132	151	159	154	143	133

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Bare #8 TC No. 89 (°F)	Conduit #6 Bare #8 TC No. 90 (°F)	Conduit #1 Bare #8 TC No. 91 (°F)	Conduit #1 Bare #8 TC No. 92 (°F)	Conduit #1 Bare #8 TC No. 93 (°F)	Conduit #1 Bare #8 TC No. 94 (°F)	Conduit #1 Bare #8 TC No. 95 (°F)	Conduit #1 Bare #8 TC No. 96 (°F)
94	95	93	133	152	160	156	146	135
95	95	93	134	153	161	158	148	137
96	96	94	134	154	163	160	150	139
97	97	95	135	155	164	161	153	142
98	98	96	136	156	165	163	155	144
99	99	96	137	157	166	164	157	146
100	99	97	138	158	167	166	159	148
101	100	97	139	158	168	167	161	150
102	101	98	140	159	169	168	162	152
103	102	99	141	160	170	169	164	155
104	103	100	141	161	170	170	165	156
105	104	100	142	161	171	171	167	158
106	105	101	143	162	172	172	168	160
107	105	102	144	163	172	173	169	162
108	106	103	144	164	173	173	170	163
109	107	104	145	164	174	174	171	165
110	108	104	146	165	174	175	172	166
111	109	105	147	166	175	175	173	168
112	110	106	148	166	175	176	174	169
113	111	107	148	167	176	177	175	170
114	112	108	149	168	177	177	176	172
115	113	108	150	169	177	178	177	173
116	114	109	151	169	178	179	177	174
117	115	110	151	170	178	180	178	175
118	116	111	152	171	179	180	179	176
119	117	111	153	171	180	181	180	177
120	118	112	154	172	180	182	181	178
121	119	113	154	173	181	182	182	179
122	120	114	155	173	182	183	182	180
123	121	115	156	174	182	184	183	181
124	122	116	157	175	183	184	184	182
125	123	117	157	175	184	185	185	183
126	124	119	158	176	184	185	185	184
127	125	120	159	176	185	186	186	185
128	127	121	159	177	185	187	187	186
129	128	123	160	178	186	187	187	187
130	130	124	161	178	186	188	188	188
131	131	125	161	179	187	188	189	188
132	132	127	162	179	188	189	189	189
133	134	128	162	180	188	190	190	190
134	136	129	163	180	189	190	191	191
135	137	131	163	181	189	191	191	192
136	138	132	164	181	190	191	192	193
137	140	133	165	182	190	192	193	194
138	141	135	165	182	191	193	194	194
139	143	136	166	183	191	193	194	195
140	144	137	167	183	192	194	195	196

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Bare #8 TC No. 89 (°F)	Conduit #6 Bare #8 TC No. 90 (°F)	Conduit #1 Bare #8 TC No. 91 (°F)	Conduit #1 Bare #8 TC No. 92 (°F)	Conduit #1 Bare #8 TC No. 93 (°F)	Conduit #1 Bare #8 TC No. 94 (°F)	Conduit #1 Bare #8 TC No. 95 (°F)	Conduit #1 Bare #8 TC No. 96 (°F)
141	146	139	167	184	192	195	196	197
142	147	140	168	184	193	195	196	198
143	149	141	169	185	194	196	197	199
144	150	142	169	185	194	196	198	199
145	152	143	170	186	195	197	198	200
146	153	144	171	186	195	198	199	201
147	153	145	171	187	196	198	200	202
148	155	146	172	187	196	199	200	202
149	155	147	173	188	197	199	201	203
150	157	151	174	188	197	200	201	204
151	158	151	174	189	198	201	202	205
152	160	152	175	189	198	201	203	205
153	159	155	175	189	199	202	203	206
154	161	155	176	190	199	202	204	207
155	163	158	176	190	200	203	204	208
156	164	159	178	190	200	203	205	208
157	165	160	179	191	200	204	206	209
158	167	160	179	191	200	204	206	210
159	168	162	180	191	200	204	207	210
160	169	164	180	192	201	205	207	211
161	171	166	181	192	201	205	208	212
162	173	165	182	192	201	206	208	213
163	174	165	182	193	202	206	209	213
164	174	167	183	193	202	207	209	214
165	175	168	183	193	202	207	210	215
166	176	168	183	193	202	207	211	216
167	179	170	184	193	202	208	211	216
168	177	173	184	194	203	208	212	217
169	177	171	185	194	203	209	212	218
170	180	172	185	195	204	210	213	219
171	181	175	186	195	204	210	214	220
172	181	173	186	195	205	211	214	220
173	185	177	185	195	205	211	215	221
174	181	176	186	195	206	212	216	222
175	184	177	186	196	206	213	217	223
176	183	180	185	196	206	213	217	224
177	185	180	185	196	207	214	218	225
178	187	183	186	196	208	215	219	226
179	189	180	186	197	208	215	220	227
180	188	181	186	197	209	216	220	228

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Bare #8 TC No. 97 (°F)	Conduit #1 Bare #8 TC No. 98 (°F)	Conduit #1 Bare #8 TC No. 99 (°F)	Conduit #1 Bare #8 TC No. 100 (°F)	Conduit #1 Bare #8 TC No. 101 (°F)	Conduit #1 Bare #8 TC No. 102 (°F)	Conduit #1 Bare #8 TC No. 103 (°F)	Conduit #1 Bare #8 TC No. 104 (°F)
0	67	67	67	66	66	66	66	66
1	67	67	67	66	66	66	66	66
2	67	67	67	66	66	66	66	66
3	67	67	67	66	67	66	66	66
4	67	67	67	66	66	66	66	66
5	67	67	67	66	66	66	66	66
6	67	67	67	66	66	66	66	66
7	67	67	67	66	66	66	66	66
8	67	67	67	67	66	66	66	66
9	67	67	67	67	66	66	66	66
10	67	67	67	67	66	66	66	66
11	67	67	67	67	66	66	66	66
12	67	67	68	67	67	66	66	66
13	67	67	68	67	66	66	66	66
14	67	68	69	68	66	66	66	66
15	67	68	70	68	67	67	67	67
16	67	69	70	69	67	67	67	67
17	68	69	71	69	67	67	67	67
18	68	70	72	70	68	67	67	67
19	68	70	73	70	68	67	67	67
20	68	71	74	71	68	68	67	67
21	69	72	74	71	69	68	68	67
22	69	72	75	72	69	68	68	68
23	69	73	76	73	70	69	68	68
24	70	74	77	74	70	69	68	68
25	70	75	78	74	70	69	69	68
26	71	76	79	75	71	70	69	69
27	71	76	80	76	71	70	70	69
28	72	77	81	77	72	70	70	69
29	72	78	82	77	72	71	70	70
30	73	79	83	78	73	71	71	70
31	73	80	84	79	74	72	71	70
32	74	80	85	79	74	72	72	71
33	75	81	86	80	75	73	72	71
34	75	82	87	81	75	73	73	72
35	76	83	88	82	76	74	74	73
36	77	84	89	82	77	74	75	74
37	77	85	90	83	77	75	77	76
38	78	86	91	84	78	76	79	78
39	79	87	92	85	79	77	81	80
40	79	88	93	86	79	78	83	82
41	80	89	94	87	80	80	86	85
42	81	90	96	88	81	81	88	87
43	82	91	97	89	82	82	90	90
44	82	92	98	90	83	84	92	92
45	83	93	99	91	84	85	95	95
46	84	94	101	92	85	87	96	97

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Bare #8 TC No. 97 (°F)	Conduit #1 Bare #8 TC No. 98 (°F)	Conduit #1 Bare #8 TC No. 99 (°F)	Conduit #1 Bare #8 TC No. 100 (°F)	Conduit #1 Bare #8 TC No. 101 (°F)	Conduit #1 Bare #8 TC No. 102 (°F)	Conduit #1 Bare #8 TC No. 103 (°F)	Conduit #1 Bare #8 TC No. 104 (°F)
47	85	95	102	93	87	88	99	99
48	86	96	103	94	87	89	100	101
49	87	98	105	95	89	90	102	103
50	88	99	106	97	90	92	104	105
51	89	100	107	98	91	93	105	106
52	90	101	108	99	92	95	107	108
53	91	102	110	100	93	96	109	109
54	92	104	111	101	94	97	110	111
55	93	105	112	102	95	98	112	113
56	94	106	113	103	96	99	113	114
57	96	107	115	105	98	101	115	116
58	97	108	116	106	99	102	116	117
59	98	109	117	107	100	103	118	119
60	99	111	118	108	101	104	119	120
61	100	112	119	109	102	105	120	121
62	101	113	121	110	103	106	122	123
63	102	114	122	111	104	108	123	124
64	103	115	123	112	105	109	124	125
65	104	116	124	113	106	110	125	127
66	105	117	125	115	108	111	126	128
67	106	118	126	116	109	112	127	129
68	107	120	127	117	110	113	128	130
69	108	121	129	118	111	114	130	131
70	109	122	130	119	112	115	131	133
71	110	123	131	120	113	116	132	134
72	111	124	132	121	114	117	133	135
73	112	125	133	122	115	118	134	136
74	113	126	134	123	116	119	135	137
75	114	127	135	124	117	120	136	138
76	115	128	135	125	118	121	137	139
77	116	128	136	126	119	123	138	140
78	117	129	137	127	120	124	139	141
79	118	130	138	128	121	125	140	143
80	119	131	139	129	122	126	141	144
81	120	132	140	130	123	127	142	145
82	121	133	141	131	124	128	143	146
83	122	134	142	132	125	129	144	147
84	123	135	143	133	127	130	145	148
85	124	136	143	134	128	131	146	149
86	125	137	144	135	129	132	147	150
87	126	138	145	137	130	133	148	151
88	128	139	146	138	131	134	149	152
89	129	140	147	139	132	135	150	153
90	130	140	148	140	133	136	151	155
91	131	142	149	141	134	137	152	156
92	132	143	150	142	135	138	153	157
93	134	144	151	143	136	140	155	158

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Bare #8 TC No. 97 (°F)	Conduit #1 Bare #8 TC No. 98 (°F)	Conduit #1 Bare #8 TC No. 99 (°F)	Conduit #1 Bare #8 TC No. 100 (°F)	Conduit #1 Bare #8 TC No. 101 (°F)	Conduit #1 Bare #8 TC No. 102 (°F)	Conduit #1 Bare #8 TC No. 103 (°F)	Conduit #1 Bare #8 TC No. 104 (°F)
94	135	145	152	144	138	141	156	159
95	136	146	153	145	139	142	157	160
96	138	147	154	146	140	143	158	161
97	140	148	155	148	141	144	159	162
98	141	149	156	149	142	146	160	163
99	143	151	157	150	144	147	161	164
100	145	152	159	151	145	148	163	165
101	146	153	160	153	146	149	164	167
102	148	155	161	154	148	151	165	168
103	150	156	163	155	149	152	166	169
104	152	158	164	156	150	153	167	170
105	154	159	165	158	151	154	168	171
106	156	161	167	160	153	155	169	172
107	157	163	169	161	154	157	170	173
108	159	165	170	163	155	158	171	174
109	161	166	172	164	157	159	172	175
110	163	168	174	166	158	160	173	176
111	165	170	175	167	159	162	174	177
112	167	172	177	169	161	163	175	178
113	168	173	179	171	163	164	176	179
114	170	175	180	172	164	165	177	180
115	171	177	182	174	165	167	178	181
116	173	178	183	175	167	168	179	182
117	174	180	185	176	168	169	180	183
118	175	181	186	178	169	170	181	184
119	177	183	188	180	171	172	182	185
120	178	184	189	181	172	173	183	186
121	179	185	190	182	173	174	184	187
122	180	187	192	183	175	175	185	188
123	182	188	193	184	175	176	186	189
124	183	189	194	185	177	177	187	190
125	184	190	195	186	178	179	188	191
126	185	191	196	187	179	180	189	191
127	186	193	197	188	181	181	190	193
128	187	194	199	190	182	182	191	194
129	188	195	200	191	183	184	192	195
130	189	196	201	192	185	185	193	196
131	190	197	202	193	186	187	194	197
132	191	198	203	195	187	188	195	198
133	192	200	205	196	188	189	197	199
134	193	201	206	197	190	190	198	200
135	194	202	207	198	191	191	199	201
136	195	203	208	200	192	192	200	203
137	196	204	210	201	193	193	201	204
138	197	205	211	202	194	194	202	205
139	198	207	212	203	195	195	203	206
140	199	208	213	204	196	196	204	207

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Bare #8 TC No. 97 (°F)	Conduit #1 Bare #8 TC No. 98 (°F)	Conduit #1 Bare #8 TC No. 99 (°F)	Conduit #1 Bare #8 TC No. 100 (°F)	Conduit #1 Bare #8 TC No. 101 (°F)	Conduit #1 Bare #8 TC No. 102 (°F)	Conduit #1 Bare #8 TC No. 103 (°F)	Conduit #1 Bare #8 TC No. 104 (°F)
141	200	209	215	205	197	197	205	209
142	201	210	216	206	199	198	206	210
143	202	211	217	207	200	199	207	211
144	203	213	219	209	200	200	208	212
145	204	214	220	210	202	201	209	214
146	205	215	221	211	202	202	210	215
147	206	216	222	212	204	203	211	216
148	207	217	223	213	205	204	212	218
149	208	218	225	214	205	205	213	219
150	209	220	226	215	206	206	214	220
151	210	221	227	216	207	207	215	221
152	211	222	228	217	208	208	217	223
153	211	223	230	218	209	209	218	224
154	212	224	231	219	210	210	219	225
155	213	225	232	220	211	211	220	227
156	214	227	233	221	212	212	221	228
157	215	228	234	222	213	213	222	229
158	216	229	236	223	214	214	223	231
159	217	230	237	224	215	215	224	232
160	218	231	238	225	216	216	225	234
161	219	232	239	226	217	217	227	235
162	220	233	240	227	218	218	228	236
163	221	234	242	228	219	219	229	238
164	222	235	243	229	220	220	230	239
165	223	237	244	230	221	221	231	240
166	224	238	245	231	221	222	232	242
167	225	239	246	232	222	223	234	243
168	226	240	248	234	224	224	235	245
169	227	241	249	235	225	225	236	246
170	228	242	250	236	226	226	237	247
171	229	243	251	237	227	227	238	249
172	230	245	252	238	228	228	240	250
173	231	246	254	239	229	229	241	252
174	232	247	255	240	230	230	242	253
175	233	248	256	241	231	231	243	255
176	234	249	257	243	232	232	245	256
177	235	250	259	244	233	233	246	258
178	236	252	260	245	234	234	247	259
179	237	253	261	246	235	235	248	260
180	238	254	262	247	236	236	250	262

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Bare #8 TC No. 105 (°F)	Conduit #1 Bare #8 TC No. 106 (°F)	Conduit #1 Bare #8 TC No. 107 (°F)	Conduit #1 Bare #8 TC No. 108 (°F)	Conduit #1 Bare #8 TC No. 109 (°F)	Conduit #1 Bare #8 TC No. 110 (°F)	Conduit #1 Bare #8 TC No. 111 (°F)	Conduit #1 Bare #8 TC No. 112 (°F)
0	66	66	66	66	66	66	67	67
1	66	66	66	66	66	66	67	67
2	66	66	66	66	66	66	67	67
3	66	66	66	66	67	67	67	67
4	66	66	66	66	66	66	67	67
5	66	66	66	66	66	66	67	67
6	66	66	66	66	66	66	67	67
7	66	66	66	66	66	67	67	67
8	66	66	66	66	66	66	67	67
9	66	66	66	66	66	66	67	67
10	66	66	66	66	66	66	67	67
11	66	66	66	66	66	66	67	67
12	66	66	66	66	66	66	67	67
13	66	66	66	66	66	66	67	67
14	66	66	66	66	66	66	67	67
15	66	66	66	66	66	66	67	67
16	66	66	66	66	66	66	67	67
17	66	66	66	66	66	66	67	67
18	66	66	66	66	66	66	67	67
19	67	66	66	66	66	66	67	67
20	67	67	66	66	66	67	67	67
21	67	66	66	66	66	66	67	67
22	67	67	66	66	66	66	67	67
23	67	67	66	66	66	67	67	67
24	67	67	66	66	66	66	67	67
25	67	67	66	66	66	66	67	67
26	67	67	67	66	66	67	67	67
27	67	67	66	66	66	66	67	67
28	68	67	66	66	66	66	67	67
29	68	67	67	66	66	66	67	67
30	68	67	67	66	66	66	67	67
31	68	67	67	66	66	66	67	67
32	69	67	67	67	67	67	67	67
33	69	68	67	67	67	67	67	67
34	69	68	67	67	67	67	67	67
35	70	68	67	67	67	67	67	67
36	70	68	67	67	67	67	67	67
37	71	68	67	67	67	67	67	67
38	72	69	67	67	67	67	67	67
39	72	69	68	67	67	67	67	67
40	73	69	68	67	67	67	67	67
41	75	70	68	67	67	67	67	67
42	76	70	68	68	67	67	67	67
43	77	71	69	68	67	67	67	67
44	79	71	69	68	67	67	67	67
45	80	72	69	68	68	67	68	68
46	82	73	70	69	68	68	68	68

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Bare #8 TC No. 105 (°F)	Conduit #1 Bare #8 TC No. 106 (°F)	Conduit #1 Bare #8 TC No. 107 (°F)	Conduit #1 Bare #8 TC No. 108 (°F)	Conduit #1 Bare #8 TC No. 109 (°F)	Conduit #1 Bare #8 TC No. 110 (°F)	Conduit #1 Bare #8 TC No. 111 (°F)	Conduit #1 Bare #8 TC No. 112 (°F)
47	83	74	70	69	68	68	68	68
48	84	75	70	69	68	68	68	68
49	86	76	71	69	69	68	68	68
50	87	77	72	70	69	68	68	68
51	89	77	72	70	69	69	69	68
52	90	78	73	71	70	69	69	69
53	91	79	73	71	70	69	69	69
54	93	80	74	72	70	69	69	69
55	94	81	75	72	71	70	70	69
56	95	82	75	73	71	70	70	70
57	97	83	76	73	72	71	70	70
58	98	84	77	74	72	71	71	70
59	99	85	78	75	73	72	71	71
60	101	86	79	76	74	72	72	71
61	102	88	80	76	74	73	72	72
62	103	89	80	77	75	73	73	72
63	105	90	81	78	76	74	73	73
64	106	91	82	79	76	74	74	73
65	107	92	83	79	77	75	74	74
66	108	93	84	80	78	75	75	74
67	110	94	85	81	79	76	76	75
68	111	95	86	82	79	77	76	76
69	112	97	87	83	80	78	77	76
70	113	98	88	84	81	78	78	77
71	115	99	89	85	82	79	78	78
72	116	100	90	86	83	80	79	78
73	117	101	92	87	84	81	80	79
74	118	103	93	88	84	82	81	80
75	119	104	94	89	85	82	81	81
76	121	105	95	90	86	83	82	81
77	122	106	96	91	87	84	83	82
78	123	108	97	92	88	85	84	83
79	125	109	98	93	89	86	85	84
80	126	110	99	94	90	87	86	85
81	127	111	101	95	91	88	87	86
82	128	112	102	96	92	89	88	87
83	129	114	103	97	93	90	89	88
84	131	115	104	99	94	91	90	89
85	132	116	105	99	95	92	91	89
86	133	117	106	101	96	93	92	90
87	134	118	107	102	97	94	92	91
88	135	120	108	103	98	95	93	92
89	137	121	109	104	99	96	94	93
90	138	122	111	105	100	97	95	94
91	139	123	112	106	101	98	96	95
92	140	124	113	107	102	99	97	96
93	141	126	114	108	103	100	98	97

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Bare #8 TC No. 105 (°F)	Conduit #1 Bare #8 TC No. 106 (°F)	Conduit #1 Bare #8 TC No. 107 (°F)	Conduit #1 Bare #8 TC No. 108 (°F)	Conduit #1 Bare #8 TC No. 109 (°F)	Conduit #1 Bare #8 TC No. 110 (°F)	Conduit #1 Bare #8 TC No. 111 (°F)	Conduit #1 Bare #8 TC No. 112 (°F)
94	142	127	115	109	104	101	99	98
95	144	128	116	110	105	101	100	99
96	145	129	117	111	106	102	101	100
97	146	130	118	112	107	103	102	101
98	147	132	120	113	108	104	103	102
99	149	133	121	114	109	105	104	102
100	150	134	122	115	110	106	105	103
101	151	135	123	116	111	107	106	104
102	152	137	125	117	112	109	107	105
103	153	136	126	119	114	110	108	106
104	154	139	127	120	115	111	109	107
105	156	141	128	121	116	112	110	108
106	157	142	130	122	117	113	111	110
107	158	143	131	123	118	114	112	111
108	159	145	132	125	119	115	113	112
109	161	146	134	126	120	116	114	113
110	162	147	135	127	121	117	115	114
111	163	148	136	128	123	118	117	115
112	164	150	137	130	124	120	118	116
113	165	151	139	131	125	121	119	117
114	166	152	140	132	126	122	120	118
115	167	154	141	133	127	123	121	119
116	169	155	143	135	129	124	122	120
117	170	156	144	136	130	125	123	121
118	171	157	145	137	131	126	124	122
119	172	159	146	138	132	127	125	124
120	173	160	148	139	133	128	126	125
121	174	161	149	141	134	129	128	126
122	175	163	150	142	135	131	129	127
123	177	164	152	143	136	132	130	128
124	178	165	153	145	138	133	131	129
125	179	166	154	146	139	134	132	130
126	180	168	156	147	140	135	133	131
127	181	169	157	148	142	136	134	133
128	182	170	158	150	143	138	136	134
129	184	171	160	151	144	140	138	135
130	185	173	161	153	146	141	140	137
131	186	174	162	154	148	143	142	138
132	187	175	163	156	149	145	144	140
133	188	177	165	157	151	147	145	141
134	190	178	167	159	153	149	147	143
135	191	179	168	160	154	150	149	145
136	192	181	169	162	156	152	151	146
137	194	182	171	163	158	154	153	148
138	195	184	172	165	160	155	154	150
139	196	185	174	167	162	157	156	152
140	198	186	175	168	163	159	158	154

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Bare #8 TC No. 105 (°F)	Conduit #1 Bare #8 TC No. 106 (°F)	Conduit #1 Bare #8 TC No. 107 (°F)	Conduit #1 Bare #8 TC No. 108 (°F)	Conduit #1 Bare #8 TC No. 109 (°F)	Conduit #1 Bare #8 TC No. 110 (°F)	Conduit #1 Bare #8 TC No. 111 (°F)	Conduit #1 Bare #8 TC No. 112 (°F)
141	199	188	177	170	165	160	159	155
142	201	189	179	172	167	162	161	157
143	202	191	180	173	169	163	162	158
144	203	192	182	175	170	165	164	160
145	205	194	183	177	172	167	165	161
146	206	195	185	178	174	168	166	163
147	208	197	187	180	175	169	167	164
148	209	199	188	182	177	170	169	165
149	211	200	190	183	178	172	170	166
150	212	202	191	185	180	173	170	167
151	214	203	193	187	181	174	171	168
152	215	205	195	188	183	175	172	169
153	217	207	196	190	184	177	172	170
154	218	208	198	191	186	177	173	171
155	220	210	200	193	187	179	174	172
156	221	211	201	195	188	180	175	173
157	223	213	203	196	190	181	176	174
158	224	215	205	198	191	182	176	175
159	226	216	206	199	193	184	177	176
160	227	218	208	201	194	185	178	177
161	229	220	210	202	195	186	179	178
162	230	221	211	204	197	187	179	179
163	232	223	213	206	198	188	180	180
164	233	225	215	207	199	189	181	181
165	235	226	216	209	200	191	182	182
166	237	228	218	210	202	192	184	183
167	238	230	220	211	203	194	187	184
168	240	231	221	213	204	195	190	186
169	241	233	223	214	205	197	192	187
170	243	235	225	216	207	198	193	189
171	244	236	226	217	208	200	195	190
172	246	238	228	219	209	201	196	191
173	248	240	229	220	211	202	197	192
174	249	241	231	222	212	204	198	193
175	251	243	233	223	213	205	200	194
176	252	245	234	225	215	206	201	196
177	254	246	236	226	216	208	202	197
178	255	248	237	228	218	209	204	198
179	257	249	239	229	219	210	205	199
180	259	251	241	231	221	212	206	200

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Bare #8 TC No. 113 (°F)	Conduit #1 Bare #8 TC No. 114 (°F)	Conduit #1 Bare #8 TC No. 115 (°F)	Conduit #1 Bare #8 TC No. 116 (°F)	Conduit #3 Bare #8 TC No. 117 (°F)	Conduit #3 Bare #8 TC No. 118 (°F)	Conduit #3 Bare #8 TC No. 119 (°F)	Conduit #3 Bare #8 TC No. 120 (°F)
0	67	67	68	69	69	69	68	68
1	67	67	68	69	69	69	68	68
2	67	67	68	69	69	69	68	68
3	67	67	68	69	69	69	68	68
4	67	67	68	69	69	69	68	68
5	67	67	68	69	69	69	68	68
6	67	67	68	69	69	69	68	68
7	67	67	68	69	69	69	68	68
8	67	67	68	69	69	69	68	68
9	67	67	68	69	69	69	68	68
10	67	67	68	69	69	69	68	68
11	67	67	68	69	69	69	68	68
12	67	67	68	69	69	69	68	68
13	67	67	68	69	69	69	68	68
14	67	67	68	69	70	69	68	68
15	67	67	68	69	70	69	68	68
16	67	67	68	69	70	69	68	68
17	67	67	68	69	70	69	68	68
18	67	67	68	69	70	69	68	68
19	67	67	68	69	70	69	68	68
20	67	67	68	69	70	69	68	68
21	67	67	68	69	70	69	68	68
22	67	67	68	69	70	69	68	68
23	67	67	68	69	70	69	69	68
24	67	67	68	69	70	69	69	68
25	67	67	68	69	70	70	69	68
26	67	67	68	69	70	70	69	69
27	67	67	68	69	70	70	69	69
28	67	67	68	69	70	70	70	69
29	67	67	68	69	70	70	70	69
30	67	67	68	69	71	71	70	70
31	67	67	68	69	71	71	71	70
32	67	68	68	69	71	71	71	70
33	67	68	68	69	71	72	72	71
34	67	68	68	69	72	72	72	71
35	67	68	69	70	72	73	73	72
36	67	68	69	70	72	73	73	72
37	67	68	69	70	72	74	74	73
38	67	68	69	70	73	74	75	73
39	67	68	69	70	73	75	75	74
40	67	68	69	70	73	75	76	74
41	67	68	69	70	74	76	77	75
42	68	68	69	71	74	77	78	76
43	68	68	69	71	75	77	78	76
44	68	68	70	71	75	78	79	77
45	68	69	70	71	76	79	80	78
46	68	69	70	71	76	80	81	79

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Bare #8 TC No. 113 (°F)	Conduit #1 Bare #8 TC No. 114 (°F)	Conduit #1 Bare #8 TC No. 115 (°F)	Conduit #1 Bare #8 TC No. 116 (°F)	Conduit #3 Bare #8 TC No. 117 (°F)	Conduit #3 Bare #8 TC No. 118 (°F)	Conduit #3 Bare #8 TC No. 119 (°F)	Conduit #3 Bare #8 TC No. 120 (°F)
47	68	69	70	72	77	80	82	79
48	68	69	70	72	77	81	83	80
49	68	69	71	72	78	82	84	81
50	69	70	71	73	78	83	85	82
51	69	70	71	73	79	84	86	83
52	69	70	72	73	79	85	87	84
53	69	70	72	74	80	85	89	85
54	70	71	72	74	81	86	90	86
55	70	71	73	76	81	87	91	87
56	70	71	73	75	82	88	92	88
57	70	72	74	76	82	89	93	90
58	71	72	74	76	83	90	94	91
59	71	73	75	77	84	91	96	92
60	72	73	75	77	85	92	97	93
61	72	74	76	78	85	93	98	94
62	73	74	77	78	86	94	100	95
63	73	75	77	79	87	95	101	97
64	74	75	78	79	87	97	102	98
65	74	76	78	80	88	98	104	99
66	75	76	79	80	89	99	105	100
67	76	77	80	81	90	100	107	102
68	76	78	80	82	91	102	109	103
69	77	79	81	82	92	103	110	104
70	77	79	82	83	93	104	112	106
71	78	80	82	83	94	106	114	107
72	79	81	83	84	95	107	116	109
73	80	81	84	85	96	109	118	110
74	80	82	85	85	97	111	120	112
75	81	83	85	86	98	112	123	114
76	82	84	86	86	99	114	125	116
77	83	85	87	87	100	116	127	118
78	84	86	88	88	101	118	130	121
79	85	86	89	89	102	119	132	123
80	86	87	89	89	104	121	135	125
81	86	88	90	90	105	122	137	128
82	87	89	91	91	106	124	139	131
83	88	90	92	91	107	126	142	133
84	89	91	93	92	108	127	144	136
85	90	92	93	92	109	128	146	138
86	91	93	94	93	110	130	147	141
87	92	93	95	94	111	131	149	143
88	93	94	96	94	112	132	151	145
89	94	95	96	95	113	133	152	148
90	95	96	97	96	114	134	154	150
91	95	97	98	96	114	135	155	152
92	96	98	99	97	115	136	156	154
93	97	98	100	98	116	137	157	155

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Bare #8 TC No. 113 (°F)	Conduit #1 Bare #8 TC No. 114 (°F)	Conduit #1 Bare #8 TC No. 115 (°F)	Conduit #1 Bare #8 TC No. 116 (°F)	Conduit #3 Bare #8 TC No. 117 (°F)	Conduit #3 Bare #8 TC No. 118 (°F)	Conduit #3 Bare #8 TC No. 119 (°F)	Conduit #3 Bare #8 TC No. 120 (°F)
94	98	99	100	98	117	138	158	157
95	99	100	101	99	117	138	159	159
96	100	101	102	100	118	139	160	160
97	101	102	103	100	119	140	161	162
98	102	103	104	101	120	141	162	163
99	103	104	104	102	120	141	163	164
100	104	105	105	102	121	142	164	165
101	105	106	106	103	121	143	164	166
102	106	107	107	104	122	143	165	167
103	107	108	108	105	123	144	166	168
104	108	108	109	105	123	145	166	169
105	109	109	110	106	124	145	167	170
106	110	110	111	107	125	146	167	171
107	111	111	111	108	125	146	168	171
108	112	112	112	108	126	147	168	172
109	113	113	113	109	126	147	169	173
110	114	114	114	110	127	148	169	173
111	115	115	115	111	127	149	170	174
112	116	117	116	112	128	149	171	175
113	117	118	117	113	128	150	171	175
114	118	119	118	114	129	150	172	176
115	119	120	119	115	130	151	172	176
116	120	121	120	116	130	151	173	177
117	121	122	121	117	131	152	173	178
118	122	123	122	118	131	152	174	178
119	123	124	124	119	132	153	174	179
120	124	125	125	120	132	154	175	180
121	126	126	126	121	133	154	176	180
122	127	127	127	122	134	155	176	181
123	128	128	128	124	134	156	177	182
124	129	129	130	125	135	157	178	183
125	130	131	131	127	136	157	179	183
126	131	132	132	128	136	158	179	184
127	132	133	134	129	137	159	180	184
128	134	134	135	131	138	159	180	185
129	135	136	136	132	139	160	181	186
130	136	137	138	133	139	161	182	186
131	138	139	139	135	140	161	182	187
132	139	140	141	136	141	162	183	187
133	141	141	142	137	141	163	184	188
134	142	143	144	139	142	163	184	189
135	144	144	145	140	143	164	185	189
136	146	146	146	141	143	165	185	190
137	147	147	148	143	144	165	186	190
138	149	149	149	144	145	166	186	191
139	151	151	151	145	145	166	187	192
140	153	152	152	146	146	167	187	192

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Bare #8 TC No. 113 (°F)	Conduit #1 Bare #8 TC No. 114 (°F)	Conduit #1 Bare #8 TC No. 115 (°F)	Conduit #1 Bare #8 TC No. 116 (°F)	Conduit #3 Bare #8 TC No. 117 (°F)	Conduit #3 Bare #8 TC No. 118 (°F)	Conduit #3 Bare #8 TC No. 119 (°F)	Conduit #3 Bare #8 TC No. 120 (°F)
141	154	154	154	148	147	167	188	193
142	156	155	155	149	147	168	188	193
143	157	157	156	150	148	169	189	194
144	159	158	158	151	149	169	189	194
145	159	160	159	152	150	170	190	195
146	162	161	160	153	151	170	190	195
147	162	162	161	154	152	171	191	196
148	163	164	163	155	153	172	191	196
149	164	165	164	156	153	172	192	197
150	165	166	165	157	154	173	192	197
151	167	167	166	158	156	174	193	198
152	168	168	167	158	157	175	193	198
153	169	169	168	159	158	176	194	198
154	170	171	169	160	159	176	194	199
155	171	172	170	161	159	177	194	199
156	173	173	171	162	159	177	195	199
157	174	174	172	162	160	178	195	199
158	175	175	173	163	161	178	195	200
159	176	176	174	164	164	181	195	200
160	177	177	175	165	163	181	196	200
161	178	178	176	166	164	182	196	200
162	179	179	177	167	163	180	196	200
163	180	180	177	168	162	179	196	200
164	181	181	178	169	163	180	196	200
165	182	182	179	170	164	179	196	200
166	183	183	180	171	163	179	196	200
167	184	184	181	172	163	178	196	201
168	185	185	182	172	167	182	196	201
169	186	186	183	174	166	184	197	201
170	187	187	184	174	168	182	197	201
171	188	187	184	175	169	184	197	201
172	189	188	185	176	170	184	198	201
173	190	189	186	176	171	184	198	202
174	191	190	186	177	173	185	198	202
175	192	191	187	178	172	185	198	202
176	193	192	188	178	171	184	198	202
177	194	193	188	178	176	187	199	203
178	195	193	183	178	177	188	199	203
179	195	193	187	179	174	186	199	203
180	196	194	189	180	174	185	199	203

Time (min)	Conduit #3 Bare #8 TC No. 121 (°F)	Conduit #3 Bare #8 TC No. 122 (°F)	Conduit #3 Bare #8 TC No. 123 (°F)	Conduit #3 Bare #8 TC No. 124 (°F)	Conduit #3 Bare #8 TC No. 125 (°F)	Conduit #3 Bare #8 TC No. 126 (°F)	Conduit #3 Bare #8 TC No. 127 (°F)	Conduit #3 Bare #8 TC No. 128 (°F)
0	67	67	67	67	66	66	66	66
1	67	67	67	67	66	66	66	66
2	67	67	67	67	67	66	66	66
3	67	67	67	67	67	67	66	66
4	67	67	67	67	67	66	66	66
5	67	67	67	67	67	66	66	66
6	67	67	67	67	67	67	66	66
7	67	67	67	67	67	66	66	66
8	67	67	67	67	67	66	66	66
9	67	67	67	67	67	67	66	66
10	67	67	67	67	67	66	66	66
11	67	67	67	67	67	67	66	66
12	67	67	67	67	67	67	66	66
13	67	67	67	67	67	67	67	67
14	67	67	67	67	68	67	67	67
15	67	67	67	67	68	68	67	67
16	67	67	67	68	69	68	67	67
17	67	67	67	68	70	69	68	67
18	67	67	67	68	71	70	68	67
19	67	67	67	69	72	71	68	68
20	67	67	68	70	73	71	69	68
21	67	67	68	70	74	72	69	68
22	68	68	68	71	76	73	70	69
23	68	68	69	72	77	74	71	69
24	68	68	69	73	78	75	71	69
25	68	68	69	74	80	76	72	70
26	68	68	70	75	81	77	72	70
27	68	69	70	76	83	78	73	71
28	69	69	71	77	84	79	74	71
29	69	69	72	78	86	80	74	72
30	69	70	72	79	87	81	75	72
31	69	70	73	81	89	82	76	73
32	70	70	73	82	90	83	76	73
33	70	71	74	83	92	84	77	74
34	70	71	75	84	93	85	78	74
35	71	72	76	85	95	86	78	75
36	71	72	76	87	97	87	79	75
37	72	73	77	88	98	88	80	76
38	72	73	78	89	99	89	80	77
39	73	74	79	90	101	90	81	77
40	73	74	80	92	102	91	82	78
41	74	75	80	93	104	92	82	79
42	74	76	81	94	105	93	83	79
43	75	76	82	95	106	94	84	80
44	76	77	83	97	108	95	85	81
45	76	78	84	98	109	96	86	82
46	77	78	85	99	111	97	86	83

OMEGA POINT LABORATORIES

Time (min)	Conduit #3 Bare #8 TC No. 121 (°F)	Conduit #3 Bare #8 TC No. 122 (°F)	Conduit #3 Bare #8 TC No. 123 (°F)	Conduit #3 Bare #8 TC No. 124 (°F)	Conduit #3 Bare #8 TC No. 125 (°F)	Conduit #3 Bare #8 TC No. 126 (°F)	Conduit #3 Bare #8 TC No. 127 (°F)	Conduit #3 Bare #8 TC No. 128 (°F)
47	78	79	86	101	112	98	87	84
48	78	80	87	102	114	99	88	85
49	79	81	88	103	115	100	89	86
50	80	82	90	105	117	101	90	87
51	81	83	91	106	118	103	91	88
52	82	84	92	107	119	104	92	89
53	83	85	93	109	121	105	93	90
54	84	86	94	110	122	106	94	91
55	85	87	95	111	123	107	95	92
56	86	88	96	112	124	108	96	93
57	87	89	97	114	126	109	97	94
58	88	90	98	115	127	110	98	95
59	89	91	99	116	128	111	99	97
60	90	91	100	117	129	112	100	98
61	91	92	101	118	130	113	101	99
62	92	93	102	119	130	114	102	100
63	93	94	103	120	131	115	103	102
64	94	95	104	120	132	116	104	103
65	95	96	105	121	133	117	105	104
66	96	97	106	122	134	118	106	106
67	97	98	106	123	135	119	107	107
68	98	99	107	124	136	120	109	109
69	99	100	108	125	137	121	110	110
70	100	101	109	126	137	122	111	111
71	101	102	110	126	138	123	112	113
72	103	103	111	127	139	124	113	114
73	104	104	112	128	140	125	114	115
74	105	105	112	129	141	126	115	117
75	106	106	113	130	142	127	116	118
76	108	107	114	130	142	128	118	119
77	109	108	115	131	143	129	119	120
78	111	109	116	132	144	130	120	121
79	112	110	117	133	145	131	121	123
80	114	111	118	133	145	131	122	124
81	116	112	119	134	146	132	123	125
82	118	114	120	135	147	133	124	126
83	120	115	121	136	148	134	125	127
84	122	116	122	137	148	135	126	128
85	124	117	123	137	149	136	127	130
86	126	119	124	138	150	137	128	131
87	129	120	125	139	150	138	129	132
88	131	122	126	140	151	139	130	133
89	134	124	127	141	152	140	132	134
90	136	126	128	141	153	141	133	135
91	139	127	129	142	153	142	134	136
92	141	129	131	143	154	143	135	137
93	143	132	132	144	155	144	136	139

OMEGA POINT LABORATORIES

Time (min)	Conduit #3 Bare #8 TC No. 121 (°F)	Conduit #3 Bare #8 TC No. 122 (°F)	Conduit #3 Bare #8 TC No. 123 (°F)	Conduit #3 Bare #8 TC No. 124 (°F)	Conduit #3 Bare #8 TC No. 125 (°F)	Conduit #3 Bare #8 TC No. 126 (°F)	Conduit #3 Bare #8 TC No. 127 (°F)	Conduit #3 Bare #8 TC No. 128 (°F)
94	146	134	133	145	156	145	137	140
95	148	136	135	146	157	146	138	141
96	150	139	137	147	158	147	140	142
97	153	141	138	148	158	148	141	143
98	155	144	140	149	159	149	142	144
99	157	146	142	150	160	150	143	145
100	158	148	144	151	161	151	144	147
101	160	151	146	153	162	153	145	148
102	162	153	149	154	163	154	147	149
103	163	155	151	156	164	155	148	150
104	165	157	153	157	166	156	149	151
105	166	159	155	159	167	157	150	153
106	167	161	158	160	168	158	152	154
107	168	163	160	162	169	160	153	155
108	170	165	162	164	170	161	154	156
109	171	166	164	165	172	162	155	157
110	172	168	166	167	173	164	157	159
111	173	169	167	169	175	165	158	160
112	173	170	169	171	176	167	160	161
113	174	172	170	172	177	168	161	163
114	175	173	172	174	179	170	163	164
115	176	174	173	175	180	171	164	165
116	177	175	174	177	181	173	166	167
117	177	176	176	178	183	174	167	168
118	178	177	177	179	184	176	169	169
119	179	178	178	181	185	178	170	171
120	180	179	179	182	187	179	172	172
121	180	179	180	183	188	181	173	173
122	181	180	181	184	189	182	174	174
123	182	181	182	185	190	183	175	175
124	182	182	183	186	191	184	176	176
125	183	183	184	187	192	185	177	177
126	184	184	185	188	193	186	179	179
127	185	184	185	189	194	187	180	180
128	185	185	186	190	195	188	181	181
129	186	186	187	191	196	189	183	183
130	187	187	188	192	197	190	184	184
131	187	187	189	193	198	191	186	186
132	188	188	190	194	199	192	187	187
133	188	189	191	195	200	193	188	188
134	189	189	191	196	201	194	189	189
135	190	190	192	197	202	195	190	190
136	190	191	193	198	203	196	191	191
137	191	192	194	199	204	197	192	191
138	192	192	194	199	205	198	193	192
139	192	193	195	200	206	199	194	193
140	193	193	196	201	206	199	194	194

OMEGA POINT LABORATORIES

Time (min)	Conduit #3 Bare #8 TC No. 121 (°F)	Conduit #3 Bare #8 TC No. 122 (°F)	Conduit #3 Bare #8 TC No. 123 (°F)	Conduit #3 Bare #8 TC No. 124 (°F)	Conduit #3 Bare #8 TC No. 125 (°F)	Conduit #3 Bare #8 TC No. 126 (°F)	Conduit #3 Bare #8 TC No. 127 (°F)	Conduit #3 Bare #8 TC No. 128 (°F)
141	193	194	196	202	207	200	195	194
142	194	195	197	203	208	201	196	195
143	195	195	198	204	209	202	197	196
144	195	196	198	204	210	203	197	197
145	196	197	199	205	211	204	198	197
146	196	197	200	206	211	204	199	198
147	197	198	200	207	212	205	200	199
148	197	198	201	207	213	206	200	199
149	198	199	201	208	214	207	201	200
150	198	199	202	209	215	207	202	201
151	199	200	202	209	216	208	202	201
152	199	200	203	210	216	209	203	202
153	199	201	203	211	217	210	204	203
154	200	201	204	211	218	211	205	203
155	200	201	204	212	219	211	206	204
156	200	202	205	212	220	212	206	205
157	201	202	205	213	220	213	207	206
158	201	202	205	213	221	214	208	206
159	201	202	206	214	222	215	209	207
160	201	203	206	215	223	216	210	208
161	201	203	206	215	224	216	211	209
162	202	203	206	216	224	217	212	210
163	202	203	207	216	225	218	212	211
164	202	203	207	217	226	219	213	212
165	202	204	207	217	227	220	214	213
166	202	204	208	218	227	221	215	213
167	202	204	208	218	228	221	216	214
168	202	204	208	219	229	222	217	215
169	203	204	209	220	230	223	218	216
170	203	205	209	220	231	224	219	217
171	203	205	209	221	232	225	220	218
172	203	205	210	221	232	226	221	219
173	203	205	210	222	233	227	221	220
174	204	206	211	223	234	228	222	221
175	204	206	211	224	235	228	223	221
176	204	206	212	224	236	229	224	222
177	204	207	212	225	237	230	225	223
178	205	207	213	226	238	231	226	224
179	205	207	213	227	239	232	227	225
180	205	208	214	228	240	233	228	226

Time (min)	Conduit #3 Bare #8 TC No. 129 (°F)	Conduit #3 Bare #8 TC No. 130 (°F)	Conduit #3 Bare #8 TC No. 131 (°F)	Conduit #3 Bare #8 TC No. 132 (°F)	Conduit #3 Bare #8 TC No. 133 (°F)	Conduit #3 Bare #8 TC No. 134 (°F)	Conduit #3 Bare #8 TC No. 135 (°F)	Conduit #3 Bare #8 TC No. 136 (°F)
0	66	66	66	66	66	66	66	66
1	66	66	66	66	66	66	66	66
2	66	66	66	66	66	66	66	66
3	66	66	66	66	66	66	66	66
4	66	66	66	66	66	66	66	67
5	66	66	66	66	66	66	66	66
6	66	66	66	66	66	66	66	67
7	66	66	66	66	66	66	66	66
8	66	66	66	66	66	66	66	67
9	66	66	66	66	66	66	66	66
10	66	66	66	66	66	66	66	66
11	66	66	66	66	66	66	66	66
12	66	66	66	66	66	66	66	66
13	66	66	66	66	66	66	66	67
14	67	66	66	66	66	66	66	66
15	67	67	66	66	66	66	66	66
16	67	67	66	66	66	66	66	66
17	67	67	67	66	66	66	66	66
18	67	67	67	66	66	66	66	67
19	67	67	67	66	66	66	66	66
20	67	67	67	66	66	66	67	67
21	68	67	67	66	66	66	67	67
22	68	67	67	67	66	66	66	67
23	68	67	67	67	66	66	67	67
24	68	67	67	67	66	66	67	67
25	69	68	67	67	66	66	66	67
26	69	68	67	67	66	66	67	67
27	69	68	67	67	66	66	67	67
28	70	68	67	67	66	66	67	67
29	70	69	67	67	66	67	67	67
30	70	69	68	67	66	67	67	67
31	71	69	68	67	67	67	67	67
32	71	69	68	67	67	67	67	67
33	72	70	68	67	67	67	67	67
34	72	70	68	67	67	67	67	67
35	73	71	69	67	67	67	67	67
36	74	71	69	68	67	67	67	67
37	74	72	69	68	67	67	67	67
38	75	72	70	68	67	67	67	67
39	75	73	70	68	67	67	67	67
40	76	74	70	68	67	67	67	67
41	77	74	71	69	68	67	67	67
42	78	75	71	69	68	67	67	67
43	79	76	72	69	68	68	67	67
44	80	77	72	70	68	68	67	67
45	81	78	73	70	69	68	68	67
46	82	79	74	71	69	68	68	68

Time (min)	Conduit #3 Bare #8 TC No. 129 (°F)	Conduit #3 Bare #8 TC No. 130 (°F)	Conduit #3 Bare #8 TC No. 131 (°F)	Conduit #3 Bare #8 TC No. 132 (°F)	Conduit #3 Bare #8 TC No. 133 (°F)	Conduit #3 Bare #8 TC No. 134 (°F)	Conduit #3 Bare #8 TC No. 135 (°F)	Conduit #3 Bare #8 TC No. 136 (°F)
47	83	80	74	71	69	69	68	68
48	84	81	75	72	70	69	68	68
49	86	83	76	72	70	69	69	68
50	87	84	77	73	71	70	69	69
51	89	86	78	74	71	70	69	69
52	90	87	79	75	72	71	70	69
53	92	89	80	76	73	71	70	70
54	93	90	82	76	73	72	71	70
55	95	92	83	78	74	73	71	71
56	96	94	84	79	75	73	72	71
57	98	95	86	80	76	74	73	72
58	99	97	87	81	77	75	73	73
59	101	99	88	82	78	76	74	73
60	103	101	90	83	79	76	75	74
61	105	102	91	85	80	77	75	75
62	107	104	93	86	81	78	76	75
63	109	107	95	87	82	79	77	76
64	111	109	96	89	83	80	78	77
65	113	111	98	90	85	81	79	78
66	115	113	100	91	86	82	80	79
67	117	114	101	93	87	84	81	80
68	119	116	103	94	88	85	82	81
69	120	118	105	96	89	86	83	82
70	122	120	106	97	91	87	84	83
71	124	122	108	98	92	88	85	84
72	125	123	109	100	93	89	86	85
73	127	125	111	101	94	90	87	86
74	128	127	112	103	96	91	88	87
75	130	128	114	104	97	93	90	88
76	131	129	115	105	98	94	91	89
77	132	131	117	106	99	95	92	90
78	134	132	118	108	100	96	93	91
79	135	133	119	109	101	97	94	92
80	136	135	120	110	102	98	95	93
81	137	136	122	111	103	99	96	94
82	139	137	123	112	105	100	97	95
83	140	138	124	113	106	101	98	96
84	141	140	125	114	107	102	99	97
85	142	141	126	115	108	103	100	98
86	143	142	127	116	108	104	101	99
87	145	143	128	117	109	105	101	100
88	146	144	130	118	110	106	102	101
89	147	145	131	119	111	106	103	102
90	148	146	131	120	112	107	104	102
91	149	147	133	121	113	108	105	103
92	150	148	134	122	114	109	106	104
93	151	149	135	123	115	110	106	105

OMEGA POINT LABORATORIES

Time (min)	Conduit #3 Bare #8 TC No. 129 (°F)	Conduit #3 Bare #8 TC No. 130 (°F)	Conduit #3 Bare #8 TC No. 131 (°F)	Conduit #3 Bare #8 TC No. 132 (°F)	Conduit #3 Bare #8 TC No. 133 (°F)	Conduit #3 Bare #8 TC No. 134 (°F)	Conduit #3 Bare #8 TC No. 135 (°F)	Conduit #3 Bare #8 TC No. 136 (°F)
94	152	150	135	124	116	111	107	106
95	153	151	136	125	117	112	108	107
96	154	152	137	126	118	112	109	108
97	155	153	138	127	118	113	110	108
98	156	154	139	128	119	114	111	109
99	157	155	140	129	120	115	112	110
100	158	156	141	130	121	116	113	111
101	159	157	142	131	122	117	113	112
102	160	158	143	132	123	118	114	113
103	162	159	144	133	124	119	115	114
104	163	160	145	134	125	120	116	115
105	164	161	146	135	126	121	117	116
106	165	162	147	136	127	122	118	117
107	166	163	149	137	128	123	119	118
108	167	164	150	138	129	124	120	119
109	168	165	151	139	130	125	121	120
110	169	166	152	140	131	126	123	121
111	170	167	153	141	133	127	124	122
112	171	168	154	142	134	128	125	123
113	172	169	155	143	135	129	126	125
114	173	170	156	144	136	130	127	126
115	175	171	157	145	137	131	128	126
116	176	172	158	146	138	132	129	127
117	177	173	159	148	139	133	130	128
118	178	174	160	149	140	134	130	129
119	179	175	161	150	141	135	131	130
120	180	176	162	151	142	136	132	130
121	181	177	163	152	143	137	133	131
122	181	178	164	153	144	138	134	132
123	182	178	165	154	145	139	134	133
124	183	179	166	155	146	140	135	134
125	184	180	167	156	147	141	136	135
126	185	181	168	157	148	142	137	136
127	186	182	169	158	150	143	138	137
128	187	183	170	159	151	144	140	139
129	188	183	171	161	152	146	141	140
130	188	184	172	162	153	147	142	141
131	189	185	174	163	155	148	144	143
132	190	186	175	165	156	150	145	145
133	191	187	176	166	158	151	147	146
134	192	188	177	167	159	153	148	148
135	193	189	178	169	161	154	150	150
136	194	190	179	170	162	156	151	151
137	194	191	181	172	164	157	153	153
138	195	191	182	173	165	159	155	155
139	196	192	183	175	167	161	156	157
140	196	193	184	176	169	162	158	158

OMEGA POINT LABORATORIES

Time (min)	Conduit #3 Bare #8 TC No. 129 (°F)	Conduit #3 Bare #8 TC No. 130 (°F)	Conduit #3 Bare #8 TC No. 131 (°F)	Conduit #3 Bare #8 TC No. 132 (°F)	Conduit #3 Bare #8 TC No. 133 (°F)	Conduit #3 Bare #8 TC No. 134 (°F)	Conduit #3 Bare #8 TC No. 135 (°F)	Conduit #3 Bare #8 TC No. 136 (°F)
141	197	194	185	178	170	164	160	160
142	198	195	187	179	172	166	161	161
143	198	196	188	180	173	167	163	163
144	199	197	189	182	175	169	164	165
145	200	198	190	183	176	170	166	166
146	200	198	191	184	178	172	167	168
147	201	199	193	186	179	173	169	169
148	202	200	194	187	180	175	170	171
149	202	201	195	188	182	176	172	172
150	203	202	196	189	183	177	173	173
151	203	203	197	191	184	178	174	174
152	204	203	198	192	185	179	175	175
153	205	204	199	193	186	181	177	177
154	205	205	200	194	188	182	178	178
155	206	206	201	195	189	183	179	179
156	207	207	202	196	190	184	180	180
157	207	208	204	198	191	185	181	181
158	208	209	205	199	192	187	182	182
159	209	209	206	200	194	188	183	183
160	210	210	207	201	195	189	184	184
161	210	211	208	203	196	190	185	184
162	211	212	209	204	198	191	186	185
163	212	213	210	205	199	193	187	186
164	213	214	212	207	200	194	188	186
165	213	215	213	208	202	195	189	187
166	214	216	214	210	203	196	190	187
167	215	217	215	211	205	197	190	188
168	216	218	217	212	206	199	191	189
169	217	219	218	214	208	200	192	189
170	218	220	219	215	209	201	193	189
171	218	221	220	216	211	203	194	190
172	219	222	222	218	212	204	195	190
173	220	223	223	219	213	205	196	190
174	221	224	224	221	215	207	196	191
175	222	225	225	222	216	208	197	191
176	223	226	227	224	218	209	198	191
177	224	227	228	225	219	211	199	191
178	225	228	229	226	221	212	200	191
179	225	229	230	228	222	213	200	191
180	227	231	232	229	224	215	201	191

Time (min)	Conduit #3 Bare #8 TC No. 137 (°F)	Conduit #3 Bare #8 TC No. 138 (°F)	Conduit #3 Bare #8 TC No. 139 (°F)	Conduit #3 Bare #8 TC No. 140 (°F)	Conduit #3 Bare #8 TC No. 141 (°F)	Conduit #3 Bare #8 TC No. 142 (°F)	Conduit #5 Bare #8 TC No. 143 (°F)	Conduit #5 Bare #8 TC No. 144 (°F)
0	67	67	67	67	68	68	69	68
1	67	67	67	67	68	68	69	68
2	67	67	67	67	68	68	69	68
3	67	67	67	67	67	68	69	68
4	67	67	67	67	68	68	69	68
5	67	67	67	67	68	68	69	68
6	67	67	67	67	68	68	69	68
7	67	67	67	67	68	68	69	69
8	67	67	67	67	68	68	69	69
9	67	67	67	67	68	68	69	69
10	67	67	67	67	68	68	69	69
11	67	67	67	67	68	68	69	69
12	67	67	67	67	68	68	69	69
13	67	67	67	67	68	68	69	69
14	67	67	67	67	68	68	69	69
15	67	67	67	67	68	68	69	69
16	67	67	67	67	68	68	69	69
17	67	67	67	67	68	68	69	69
18	67	67	67	67	68	68	69	69
19	67	67	67	67	68	68	69	69
20	67	67	67	67	68	68	70	69
21	67	67	67	67	68	68	70	69
22	67	67	67	67	68	68	70	69
23	67	67	67	67	68	68	70	69
24	67	67	67	67	68	69	70	70
25	67	67	67	67	68	69	70	70
26	67	67	67	67	68	69	70	70
27	67	67	67	67	68	69	70	70
28	67	67	67	67	68	69	71	70
29	67	67	67	67	68	69	71	71
30	67	67	67	67	68	69	71	71
31	67	67	67	67	68	69	71	71
32	67	67	67	68	68	69	71	72
33	67	67	67	68	68	69	72	72
34	67	67	67	68	68	69	72	72
35	67	67	67	68	68	69	72	73
36	67	67	67	68	68	69	73	73
37	67	67	67	68	68	69	73	74
38	67	67	67	68	68	69	73	74
39	67	67	67	68	68	69	74	75
40	67	67	67	68	68	69	74	75
41	67	67	67	68	68	69	74	76
42	67	67	67	68	68	69	75	77
43	67	67	67	68	68	69	75	77
44	67	67	68	68	68	69	76	78
45	67	67	68	68	69	69	76	79
46	68	67	68	68	69	70	77	80

OMEGA POINT LABORATORIES

Time (min)	Conduit #3 Bare #8 TC No. 137 (°F)	Conduit #3 Bare #8 TC No. 138 (°F)	Conduit #3 Bare #8 TC No. 139 (°F)	Conduit #3 Bare #8 TC No. 140 (°F)	Conduit #3 Bare #8 TC No. 141 (°F)	Conduit #3 Bare #8 TC No. 142 (°F)	Conduit #5 Bare #8 TC No. 143 (°F)	Conduit #5 Bare #8 TC No. 144 (°F)
47	68	68	68	68	69	70	77	80
48	68	68	68	68	69	70	78	81
49	68	68	68	69	69	70	78	82
50	69	68	68	69	69	70	79	83
51	69	68	69	69	69	70	80	83
52	69	69	69	69	70	71	80	84
53	70	69	69	69	70	71	81	85
54	70	70	69	70	70	71	82	86
55	71	70	70	70	70	71	82	87
56	71	70	70	70	71	71	83	88
57	72	71	71	71	71	72	84	89
58	72	71	71	71	71	72	84	90
59	73	72	72	72	72	72	85	91
60	74	73	72	72	72	73	86	91
61	74	73	73	73	73	73	86	92
62	75	74	73	73	73	73	87	93
63	76	75	74	74	74	74	88	94
64	77	75	74	74	74	74	89	95
65	77	76	75	75	75	74	89	97
66	78	77	76	75	75	75	90	98
67	79	78	77	76	76	75	91	99
68	80	79	77	77	76	76	92	100
69	81	79	78	77	77	76	93	101
70	82	80	79	78	78	77	94	103
71	83	81	80	79	78	77	95	104
72	84	82	81	80	79	78	96	105
73	85	83	81	80	80	78	97	107
74	86	84	82	81	80	79	98	109
75	87	85	83	82	81	79	99	110
76	88	86	84	83	82	80	100	112
77	89	87	85	84	82	80	101	113
78	90	88	86	85	83	81	102	115
79	91	89	87	85	84	82	104	116
80	92	90	88	86	85	82	105	118
81	93	91	89	87	85	83	106	119
82	94	92	89	88	86	83	107	121
83	95	92	90	89	87	84	108	122
84	96	93	91	90	88	85	109	124
85	97	94	92	91	88	85	110	125
86	98	95	93	91	89	86	111	127
87	99	96	94	92	90	86	112	128
88	99	97	95	93	91	87	113	129
89	100	98	96	94	91	88	114	131
90	101	99	96	95	92	88	115	132
91	102	100	97	95	93	89	116	133
92	103	100	98	96	94	89	117	134
93	104	101	99	97	94	90	117	135

OMEGA POINT LABORATORIES

Time (min)	Conduit #3 Bare #8 TC No. 137 (°F)	Conduit #3 Bare #8 TC No. 138 (°F)	Conduit #3 Bare #8 TC No. 139 (°F)	Conduit #3 Bare #8 TC No. 140 (°F)	Conduit #3 Bare #8 TC No. 141 (°F)	Conduit #3 Bare #8 TC No. 142 (°F)	Conduit #5 Bare #8 TC No. 143 (°F)	Conduit #5 Bare #8 TC No. 144 (°F)
94	105	102	100	98	95	91	118	136
95	106	103	101	99	96	91	119	137
96	107	104	102	100	97	92	120	138
97	107	105	103	101	97	93	120	138
98	108	106	103	101	98	93	121	139
99	109	107	104	102	99	94	122	140
100	110	108	105	103	100	95	122	141
101	111	109	106	104	101	95	123	141
102	112	110	107	105	102	96	124	142
103	113	111	108	106	102	97	125	143
104	114	112	109	107	103	97	125	144
105	115	113	110	108	104	98	126	144
106	116	114	111	109	105	99	126	145
107	117	115	112	110	106	100	127	146
108	118	116	113	111	107	101	128	146
109	119	117	114	112	108	101	128	147
110	121	118	115	113	109	102	129	148
111	122	119	116	114	110	103	130	149
112	123	120	117	115	111	104	131	149
113	124	121	118	116	112	105	131	150
114	125	122	120	117	113	106	132	151
115	126	123	121	118	114	107	133	152
116	126	124	121	119	115	108	134	153
117	127	125	122	120	116	108	134	154
118	128	126	123	121	117	109	135	154
119	129	127	124	122	118	110	136	155
120	130	127	125	123	119	111	137	156
121	130	128	126	124	120	112	137	157
122	131	129	127	125	120	113	138	158
123	132	130	128	126	122	114	139	159
124	133	131	129	127	123	115	140	159
125	134	132	130	128	124	116	140	160
126	136	133	131	129	125	117	141	161
127	137	135	132	130	126	118	142	161
128	138	136	133	131	127	119	143	162
129	139	137	135	133	129	121	143	163
130	141	138	136	134	130	122	144	164
131	142	140	137	135	132	123	145	164
132	144	141	139	137	133	125	145	165
133	145	143	140	138	135	126	146	165
134	147	144	142	140	136	127	147	166
135	148	146	143	141	138	129	147	167
136	150	147	145	143	139	130	148	167
137	151	149	146	144	141	131	149	168
138	153	150	148	146	142	133	150	168
139	155	152	149	147	144	134	151	169
140	156	153	151	149	145	136	151	170

OMEGA POINT LABORATORIES

Time (min)	Conduit #3 Bare #8 TC No. 137 (°F)	Conduit #3 Bare #8 TC No. 138 (°F)	Conduit #3 Bare #8 TC No. 139 (°F)	Conduit #3 Bare #8 TC No. 140 (°F)	Conduit #3 Bare #8 TC No. 141 (°F)	Conduit #3 Bare #8 TC No. 142 (°F)	Conduit #5 Bare #8 TC No. 143 (°F)	Conduit #5 Bare #8 TC No. 144 (°F)
141	158	155	152	150	147	137	152	170
142	159	157	154	152	148	138	153	171
143	161	158	156	153	149	139	154	172
144	162	160	157	155	151	140	155	172
145	164	161	159	156	152	141	157	174
146	165	162	160	158	153	142	157	175
147	167	164	161	159	154	143	159	176
148	168	165	163	161	156	144	160	176
149	169	167	164	162	157	146	162	179
150	170	168	165	163	158	149	162	178
151	172	169	167	164	160	155	164	180
152	173	171	168	166	162	156	165	181
153	174	172	169	167	163	159	165	181
154	175	173	171	168	165	162	166	182
155	176	174	172	170	167	163	168	183
156	177	175	173	171	168	164	168	184
157	178	176	174	172	170	165	169	184
158	179	177	175	173	170	166	171	185
159	180	178	176	174	171	167	170	184
160	181	179	177	175	171	166	171	184
161	182	180	178	176	172	166	171	184
162	183	181	179	177	172	168	172	185
163	184	182	180	177	172	168	172	185
164	184	183	181	178	171	171	172	186
165	185	184	181	177	171	169	172	186
166	186	184	182	177	171	169	174	185
167	187	185	182	176	173	172	173	185
168	187	186	182	178	174	171	173	184
169	188	186	182	179	174	174	174	186
170	189	187	183	179	175	174	174	186
171	189	188	182	178	175	173	175	186
172	190	187	181	178	177	173	174	185
173	190	187	182	180	177	175	174	186
174	190	188	184	180	178	175	175	185
175	190	187	185	180	176	174	174	182
176	190	187	184	180	174	176	174	183
177	191	188	184	180	177	175	174	184
178	191	188	183	179	178	179	173	183
179	191	188	185	180	180	178	174	185
180	192	189	185	182	180	179	173	183

Time (min)	Conduit #5 Bare #8 TC No. 145 (°F)	Conduit #5 Bare #8 TC No. 146 (°F)	Conduit #5 Bare #8 TC No. 147 (°F)	Conduit #5 Bare #8 TC No. 148 (°F)	Conduit #5 Bare #8 TC No. 149 (°F)	Conduit #5 Bare #8 TC No. 150 (°F)	Conduit #5 Bare #8 TC No. 151 (°F)	Conduit #5 Bare #8 TC No. 152 (°F)
0	68	67	67	67	67	66	66	66
1	68	67	67	67	67	66	66	66
2	68	67	67	67	67	67	66	66
3	68	67	67	67	67	66	66	66
4	68	67	67	67	67	66	66	66
5	68	67	67	67	67	66	66	66
6	68	67	67	67	67	66	66	66
7	68	67	67	67	67	67	67	66
8	68	67	67	67	67	66	67	66
9	68	67	67	67	67	67	67	66
10	68	67	67	67	67	67	67	67
11	68	67	67	67	67	67	68	67
12	68	67	67	67	67	67	69	67
13	68	67	67	67	67	68	70	68
14	68	67	67	67	67	68	71	69
15	68	67	67	67	67	69	73	69
16	68	67	67	67	67	70	75	71
17	68	67	67	67	68	72	77	72
18	68	67	67	67	69	73	79	73
19	68	67	67	67	69	75	82	75
20	68	68	67	68	70	77	84	76
21	68	68	67	68	71	79	86	78
22	68	68	67	68	72	81	89	79
23	68	68	68	69	73	82	91	81
24	69	68	68	69	74	84	92	82
25	69	68	68	70	75	86	94	83
26	69	68	68	70	76	87	96	85
27	69	69	69	71	77	89	98	86
28	69	69	69	71	78	90	99	87
29	70	69	69	72	78	91	100	88
30	70	69	70	72	79	93	102	89
31	71	70	70	73	80	94	103	90
32	71	70	70	73	81	95	104	91
33	71	70	71	74	82	96	105	92
34	72	71	71	74	82	97	106	93
35	72	71	71	75	83	97	107	94
36	73	72	72	75	84	98	108	95
37	73	72	72	76	84	99	108	95
38	74	73	73	77	85	100	109	96
39	74	73	73	77	86	100	109	97
40	75	74	74	77	86	101	110	98
41	76	74	74	78	87	101	111	98
42	77	75	75	79	87	102	111	99
43	77	76	75	79	88	102	112	100
44	78	76	76	80	88	103	113	101
45	79	77	77	80	89	104	114	101
46	80	78	77	81	89	104	115	102

OMEGA POINT LABORATORIES

Time (min)	Conduit #5 Bare #8 TC No. 145 (°F)	Conduit #5 Bare #8 TC No. 146 (°F)	Conduit #5 Bare #8 TC No. 147 (°F)	Conduit #5 Bare #8 TC No. 148 (°F)	Conduit #5 Bare #8 TC No. 149 (°F)	Conduit #5 Bare #8 TC No. 150 (°F)	Conduit #5 Bare #8 TC No. 151 (°F)	Conduit #5 Bare #8 TC No. 152 (°F)
47	81	79	78	81	90	105	116	103
48	82	79	79	82	91	106	117	104
49	83	80	79	83	91	106	118	105
50	84	81	80	83	92	107	119	106
51	85	82	81	84	93	108	120	108
52	86	83	82	85	94	109	121	108
53	87	84	82	85	94	110	121	110
54	88	85	83	86	95	111	122	111
55	89	86	84	87	96	112	124	112
56	90	87	85	88	97	113	125	113
57	91	88	86	89	97	113	126	114
58	92	89	87	89	98	114	127	114
59	93	90	88	90	99	115	127	115
60	94	91	89	91	100	116	128	116
61	95	92	90	92	101	117	130	118
62	97	94	91	93	101	118	130	119
63	98	95	92	94	102	119	132	120
64	99	96	93	95	103	120	133	121
65	101	97	94	95	104	121	134	122
66	102	99	95	96	105	121	135	123
67	103	100	96	97	106	122	136	124
68	105	101	97	98	107	123	137	126
69	106	102	98	99	108	124	138	127
70	108	104	99	100	108	125	139	128
71	110	105	100	101	109	126	140	129
72	111	107	102	102	110	127	141	130
73	113	109	103	103	111	128	142	131
74	115	110	104	104	112	129	142	132
75	117	112	105	105	113	130	143	133
76	120	114	107	106	114	130	144	134
77	122	116	108	107	115	131	145	135
78	124	118	110	109	116	132	146	136
79	126	121	112	110	117	133	147	137
80	128	123	113	111	118	134	148	138
81	131	126	115	112	119	135	149	139
82	133	128	117	114	120	136	149	140
83	135	131	119	115	121	137	150	141
84	137	133	121	116	122	137	151	142
85	139	136	124	118	123	138	152	143
86	141	138	126	120	124	139	153	145
87	143	141	128	121	126	140	154	146
88	145	143	131	123	127	141	155	147
89	147	145	133	125	128	142	156	148
90	148	147	136	127	129	143	157	149
91	150	149	138	129	131	144	158	150
92	151	151	141	131	132	145	159	151
93	152	153	143	133	134	146	160	152

OMEGA POINT LABORATORIES

Time (min)	Conduit #5 Bare #8 TC No. 145 (°F)	Conduit #5 Bare #8 TC No. 146 (°F)	Conduit #5 Bare #8 TC No. 147 (°F)	Conduit #5 Bare #8 TC No. 148 (°F)	Conduit #5 Bare #8 TC No. 149 (°F)	Conduit #5 Bare #8 TC No. 150 (°F)	Conduit #5 Bare #8 TC No. 151 (°F)	Conduit #5 Bare #8 TC No. 152 (°F)
94	154	155	145	135	135	147	161	154
95	155	156	148	137	137	148	162	155
96	156	158	150	140	138	150	163	156
97	157	159	152	142	140	151	164	157
98	158	160	154	144	142	152	165	158
99	159	162	156	147	144	153	166	159
100	160	163	157	149	146	155	167	161
101	160	164	159	151	148	156	168	162
102	161	165	161	153	150	157	169	163
103	162	166	162	156	152	159	171	164
104	163	167	164	158	154	160	172	165
105	163	168	165	159	157	162	173	166
106	164	168	166	161	159	164	174	168
107	165	169	167	163	161	165	175	169
108	165	170	169	165	162	167	177	170
109	166	171	170	166	164	169	178	171
110	167	172	171	168	166	170	179	173
111	167	172	172	169	168	172	181	174
112	168	173	173	170	169	173	182	175
113	169	174	173	171	171	175	184	176
114	170	174	174	173	172	177	185	178
115	170	175	175	174	174	178	186	179
116	171	176	176	175	175	180	188	180
117	172	177	177	176	176	181	189	181
118	173	177	177	177	177	182	190	183
119	174	178	178	178	178	184	191	184
120	174	179	179	178	179	185	193	185
121	175	179	180	179	181	186	194	186
122	176	180	180	180	182	188	196	187
123	177	181	181	181	183	189	197	188
124	177	182	182	182	184	190	198	190
125	178	182	183	183	185	191	199	191
126	179	183	183	183	185	192	200	192
127	179	183	184	184	186	193	202	193
128	180	184	185	185	187	195	203	195
129	180	185	185	186	188	196	204	196
130	181	185	186	187	189	197	206	197
131	182	186	187	187	190	198	207	198
132	182	187	187	188	191	199	208	200
133	183	187	188	189	192	200	209	201
134	183	188	189	190	193	202	211	202
135	184	188	190	191	194	203	212	203
136	184	189	190	191	195	204	213	204
137	185	189	191	192	196	205	214	205
138	185	190	192	193	197	206	215	207
139	186	191	192	194	198	207	216	208
140	186	191	193	194	199	209	218	209

OMEGA POINT LABORATORIES

Time (min)	Conduit #5 Bare #8 TC No. 145 (°F)	Conduit #5 Bare #8 TC No. 146 (°F)	Conduit #5 Bare #8 TC No. 147 (°F)	Conduit #5 Bare #8 TC No. 148 (°F)	Conduit #5 Bare #8 TC No. 149 (°F)	Conduit #5 Bare #8 TC No. 150 (°F)	Conduit #5 Bare #8 TC No. 151 (°F)	Conduit #5 Bare #8 TC No. 152 (°F)
141	187	192	194	195	199	210	219	210
142	188	193	194	196	200	211	220	211
143	188	193	195	197	201	212	222	212
144	189	194	196	197	202	213	223	213
145	189	194	196	198	203	214	224	214
146	190	195	197	199	204	215	225	215
147	191	195	197	200	205	216	226	216
148	191	196	198	200	206	217	227	217
149	192	197	199	201	206	219	229	218
150	192	197	199	202	207	220	230	219
151	193	198	200	202	208	221	231	220
152	193	198	200	203	209	222	232	221
153	194	198	201	203	209	223	233	222
154	194	199	201	204	210	224	234	223
155	195	199	202	204	211	225	235	224
156	195	200	202	205	212	226	236	225
157	195	200	202	205	212	227	237	225
158	196	200	203	206	213	228	238	226
159	196	200	203	206	214	229	239	227
160	196	201	203	207	214	230	241	228
161	196	201	204	207	215	231	242	229
162	196	201	204	208	216	232	243	230
163	197	201	204	208	217	233	244	231
164	197	201	204	209	217	234	245	232
165	197	201	205	209	218	234	246	233
166	197	202	205	209	219	235	247	234
167	197	202	205	210	220	236	248	235
168	197	202	205	211	221	238	249	236
169	197	202	206	211	222	239	250	237
170	197	202	206	212	223	240	251	238
171	198	203	206	212	224	241	252	239
172	198	203	207	213	225	242	254	240
173	198	203	207	214	225	243	255	241
174	197	203	207	214	226	244	256	242
175	192	203	208	215	227	245	257	244
176	193	202	208	216	228	246	258	245
177	194	197	208	216	229	247	259	246
178	194	194	206	217	230	248	260	247
179	195	198	205	217	231	249	261	248
180	196	201	207	218	232	250	262	249

Time (min)	Conduit #5 Bare #8 TC No. 153 (°F)	Conduit #5 Bare #8 TC No. 154 (°F)	Conduit #5 Bare #8 TC No. 155 (°F)	Conduit #5 Bare #8 TC No. 156 (°F)	Conduit #5 Bare #8 TC No. 157 (°F)	Conduit #5 Bare #8 TC No. 158 (°F)	Conduit #5 Bare #8 TC No. 159 (°F)	Conduit #5 Bare #8 TC No. 160 (°F)
0	66	66	66	66	66	66	66	66
1	66	66	66	66	66	66	66	66
2	66	66	66	66	66	66	66	66
3	66	66	66	66	66	66	66	66
4	66	66	66	66	66	66	66	66
5	66	66	66	66	66	66	66	66
6	66	66	66	66	66	66	66	66
7	66	66	66	66	66	66	66	66
8	66	66	66	66	66	66	66	66
9	66	66	66	66	66	66	66	66
10	66	66	66	66	66	66	66	66
11	66	66	66	66	66	66	66	66
12	66	66	66	66	66	66	66	66
13	67	66	66	66	66	66	66	66
14	67	66	66	66	66	66	66	66
15	67	67	67	66	66	66	66	66
16	67	67	67	67	66	66	66	66
17	68	67	67	67	66	66	66	66
18	69	67	67	67	66	66	66	66
19	69	68	67	67	66	66	66	66
20	70	68	68	68	67	66	66	66
21	71	69	68	68	67	66	66	66
22	71	69	69	68	67	66	66	66
23	72	70	69	69	67	66	66	66
24	73	70	70	69	67	66	66	66
25	74	71	71	70	68	67	66	66
26	75	71	72	71	68	67	66	66
27	75	72	73	72	68	67	66	66
28	76	73	74	73	69	67	66	66
29	77	73	75	74	69	67	66	66
30	78	74	76	76	70	67	67	66
31	79	75	78	77	71	68	67	66
32	79	76	79	79	72	68	67	66
33	80	77	80	80	72	68	67	67
34	81	77	82	82	73	69	67	67
35	82	78	83	83	74	69	67	67
36	82	79	84	85	75	70	67	67
37	83	80	86	86	76	70	68	67
38	84	81	87	88	77	71	68	67
39	84	82	89	90	78	71	68	67
40	85	83	90	91	79	72	69	68
41	86	84	92	93	80	73	69	68
42	87	85	93	94	82	73	69	68
43	87	86	95	96	83	74	70	68
44	88	87	97	97	84	75	70	69
45	89	88	98	99	86	76	71	69
46	90	89	100	101	87	77	71	70

OMEGA POINT LABORATORIES

Time (min)	Conduit #5 Bare #8 TC No. 153 (°F)	Conduit #5 Bare #8 TC No. 154 (°F)	Conduit #5 Bare #8 TC No. 155 (°F)	Conduit #5 Bare #8 TC No. 156 (°F)	Conduit #5 Bare #8 TC No. 157 (°F)	Conduit #5 Bare #8 TC No. 158 (°F)	Conduit #5 Bare #8 TC No. 159 (°F)	Conduit #5 Bare #8 TC No. 160 (°F)
47	91	91	102	102	88	78	72	70
48	92	92	103	104	90	79	73	71
49	93	93	105	106	91	80	74	71
50	94	94	106	107	92	81	74	72
51	95	96	108	109	94	82	75	72
52	96	97	109	110	95	83	76	73
53	97	98	110	112	97	85	77	74
54	98	99	112	113	98	86	78	74
55	99	100	113	115	100	87	79	75
56	100	101	114	116	102	89	80	76
57	101	102	115	118	103	90	81	77
58	102	103	116	119	105	91	82	78
59	103	104	117	120	106	93	83	79
60	104	105	118	122	107	94	84	80
61	105	106	120	123	109	95	86	81
62	106	107	121	124	110	97	87	82
63	107	108	122	126	112	98	88	83
64	108	109	123	127	113	99	89	84
65	109	110	125	129	115	101	90	85
66	110	111	126	130	116	102	92	86
67	111	112	127	132	118	104	93	87
68	112	113	128	133	119	105	94	88
69	113	114	130	134	121	106	96	90
70	114	115	131	136	122	108	97	91
71	115	116	132	137	124	109	98	92
72	117	118	134	139	125	111	100	93
73	118	119	135	140	126	112	101	94
74	119	120	136	141	128	114	102	96
75	120	121	137	143	129	115	104	97
76	121	122	138	144	130	116	105	98
77	122	123	140	145	132	118	106	100
78	123	124	141	146	133	119	108	101
79	124	125	142	147	134	120	109	102
80	125	126	143	149	136	121	110	103
81	126	127	144	150	137	123	112	104
82	127	129	145	151	138	124	113	106
83	128	130	146	152	139	125	114	107
84	129	131	147	153	141	127	115	108
85	130	132	149	154	142	128	116	109
86	132	133	150	155	143	129	118	110
87	133	134	151	156	144	130	119	112
88	134	135	152	157	145	131	120	113
89	135	136	153	158	146	132	121	114
90	136	137	154	159	147	133	122	115
91	137	138	155	160	148	135	123	116
92	138	140	156	161	149	136	124	117
93	139	141	157	162	150	137	125	118

OMEGA POINT LABORATORIES

Time (min)	Conduit #5 Bare #8 TC No. 153 (°F)	Conduit #5 Bare #8 TC No. 154 (°F)	Conduit #5 Bare #8 TC No. 155 (°F)	Conduit #5 Bare #8 TC No. 156 (°F)	Conduit #5 Bare #8 TC No. 157 (°F)	Conduit #5 Bare #8 TC No. 158 (°F)	Conduit #5 Bare #8 TC No. 159 (°F)	Conduit #5 Bare #8 TC No. 160 (°F)
94	141	142	158	163	151	138	126	119
95	142	143	159	164	152	139	127	120
96	143	144	160	165	153	140	128	121
97	144	145	161	166	154	141	130	122
98	145	146	162	167	155	142	130	123
99	147	147	163	168	156	143	132	124
100	148	148	164	169	157	144	133	125
101	149	150	165	169	158	145	134	126
102	150	151	166	170	159	146	135	127
103	151	152	167	171	160	148	136	128
104	153	153	168	172	161	149	137	130
105	154	154	169	173	162	150	138	131
106	155	156	170	174	163	151	139	131
107	156	157	171	175	164	152	141	133
108	158	158	172	176	165	153	142	134
109	159	160	174	177	166	154	143	135
110	161	161	175	178	167	155	144	136
111	162	162	176	179	168	156	145	137
112	163	164	177	179	169	157	146	138
113	165	165	178	180	170	158	147	139
114	166	166	179	181	171	159	148	140
115	168	167	180	182	172	160	149	141
116	169	169	181	183	173	161	150	142
117	170	170	182	184	173	162	151	143
118	171	171	183	185	174	163	152	144
119	173	173	184	186	175	164	153	145
120	174	174	185	187	176	165	154	146
121	175	175	187	187	177	166	155	147
122	176	176	188	188	178	167	156	148
123	177	177	189	189	179	168	157	149
124	179	178	189	190	180	168	158	150
125	180	180	190	191	180	169	159	151
126	181	181	191	192	181	170	160	152
127	182	182	192	192	182	171	161	153
128	184	183	193	193	183	172	162	154
129	185	185	194	194	184	173	163	155
130	187	186	195	195	185	174	164	157
131	188	187	196	196	186	175	165	158
132	189	188	196	197	187	176	166	159
133	190	190	197	197	188	177	168	160
134	192	191	198	198	189	178	169	161
135	193	192	199	199	190	179	170	163
136	194	193	199	200	191	181	171	164
137	195	193	200	200	192	181	172	165
138	196	194	201	201	193	183	173	167
139	197	195	201	202	194	184	175	168
140	198	196	202	203	195	185	176	169

Time (min)	Conduit #5 Bare #8 TC No. 153 (°F)	Conduit #5 Bare #8 TC No. 154 (°F)	Conduit #5 Bare #8 TC No. 155 (°F)	Conduit #5 Bare #8 TC No. 156 (°F)	Conduit #5 Bare #8 TC No. 157 (°F)	Conduit #5 Bare #8 TC No. 158 (°F)	Conduit #5 Bare #8 TC No. 159 (°F)	Conduit #5 Bare #8 TC No. 160 (°F)
141	199	197	203	204	196	186	177	170
142	200	198	204	205	197	187	178	172
143	201	199	204	205	198	188	180	173
144	202	200	205	206	199	189	181	174
145	203	200	206	207	200	190	182	176
146	203	201	206	208	201	192	183	177
147	204	202	207	209	202	193	184	178
148	205	203	208	210	203	194	186	180
149	206	204	208	210	204	195	187	181
150	207	205	209	211	205	196	188	182
151	208	205	210	212	206	198	189	183
152	209	206	210	213	207	199	191	184
153	210	207	211	214	209	200	192	186
154	211	208	212	215	210	201	193	187
155	212	209	213	216	211	203	195	188
156	212	210	213	217	212	204	196	189
157	213	210	214	218	213	205	197	191
158	214	211	215	219	215	207	199	192
159	215	212	215	220	216	208	200	193
160	216	213	216	221	217	209	201	195
161	217	214	217	222	218	211	203	196
162	218	215	218	223	220	212	204	198
163	218	216	219	224	221	214	206	199
164	219	216	220	225	222	215	207	200
165	220	217	221	226	224	216	209	202
166	221	218	222	228	225	218	210	203
167	222	219	223	229	226	220	212	203
168	223	220	224	230	228	221	213	204
169	224	221	225	231	229	222	214	205
170	225	222	226	233	231	224	216	207
171	226	223	227	234	232	225	217	208
172	227	224	228	235	233	227	219	210
173	228	225	229	236	235	228	221	212
174	229	225	230	237	236	230	222	213
175	230	227	231	239	238	232	224	215
176	231	228	232	240	239	233	225	216
177	232	229	233	242	240	235	227	218
178	233	230	234	243	242	236	229	220
179	234	231	235	244	243	238	230	222
180	235	232	236	246	245	239	232	223

Time (min)	Conduit #5 Bare #8 TC No. 161 (°F)	Conduit #5 Bare #8 TC No. 162 (°F)	Conduit #5 Bare #8 TC No. 163 (°F)	Conduit #5 Bare #8 TC No. 164 (°F)	Conduit #5 Bare #8 TC No. 165 (°F)	Conduit #5 Bare #8 TC No. 166 (°F)	Conduit #5 Bare #8 TC No. 167 (°F)	Conduit #5 Bare #8 TC No. 168 (°F)
0	66	66	66	66	66	67	67	68
1	66	66	66	66	66	67	67	68
2	66	66	66	66	67	67	67	68
3	66	66	66	66	67	67	67	68
4	66	66	66	66	66	67	67	68
5	66	66	66	66	66	67	67	68
6	66	66	66	66	66	67	67	68
7	66	66	66	66	66	67	67	68
8	66	66	66	66	66	67	67	68
9	66	66	66	66	67	67	67	68
10	66	66	66	66	67	67	67	68
11	66	66	66	66	67	67	67	68
12	66	66	66	66	67	67	67	68
13	66	66	66	66	67	67	67	68
14	66	66	66	66	67	67	67	68
15	66	66	66	66	67	67	67	68
16	66	66	66	66	67	67	67	68
17	66	66	66	66	67	67	68	68
18	66	66	66	66	67	67	68	68
19	66	66	66	66	67	67	68	68
20	66	66	66	66	67	67	68	69
21	66	66	66	66	67	67	68	69
22	66	66	66	66	67	67	68	69
23	66	66	66	66	67	67	68	69
24	66	66	66	66	67	67	68	69
25	66	66	66	66	67	67	68	69
26	66	66	66	66	67	67	68	69
27	66	66	66	66	67	67	68	69
28	66	66	66	66	67	67	68	69
29	66	66	66	66	67	67	68	69
30	66	66	66	66	67	67	68	69
31	66	66	66	66	67	67	68	70
32	66	66	66	66	67	67	68	70
33	66	66	66	67	67	68	69	70
34	66	66	66	67	67	68	69	70
35	67	66	66	67	67	68	69	70
36	67	67	66	67	67	68	69	70
37	67	67	67	67	67	68	69	71
38	67	67	67	67	67	68	69	71
39	67	67	67	67	67	68	69	71
40	67	67	67	67	67	68	70	71
41	67	67	67	67	67	68	70	71
42	67	67	67	67	68	69	70	72
43	68	67	67	67	68	69	70	72
44	68	68	67	67	68	69	70	72
45	68	68	68	68	68	69	71	72
46	68	68	68	68	68	69	71	73

Time (min)	Conduit #5 Bare #8 TC No. 161 (°F)	Conduit #5 Bare #8 TC No. 162 (°F)	Conduit #5 Bare #8 TC No. 163 (°F)	Conduit #5 Bare #8 TC No. 164 (°F)	Conduit #5 Bare #8 TC No. 165 (°F)	Conduit #5 Bare #8 TC No. 166 (°F)	Conduit #5 Bare #8 TC No. 167 (°F)	Conduit #5 Bare #8 TC No. 168 (°F)
47	69	68	68	68	68	69	71	73
48	69	69	68	68	69	70	71	73
49	70	69	69	68	69	70	72	73
50	70	69	69	69	69	70	72	74
51	71	70	69	69	69	70	72	74
52	71	70	70	69	70	71	73	74
53	72	71	70	70	70	71	73	75
54	72	71	71	70	70	71	73	75
55	73	72	71	71	71	72	74	76
56	74	72	72	71	71	72	74	76
57	74	73	72	71	72	73	75	76
58	75	74	73	72	72	73	75	77
59	76	74	74	73	72	74	76	77
60	77	75	74	73	73	74	76	78
61	78	76	75	74	73	75	77	78
62	78	77	76	74	74	75	77	79
63	79	77	76	75	75	76	78	79
64	80	78	77	76	75	76	78	80
65	81	79	78	76	76	77	79	80
66	82	80	79	77	77	78	80	81
67	83	81	79	78	77	78	80	81
68	84	82	80	79	78	79	81	82
69	85	83	81	79	79	80	81	82
70	86	84	82	80	80	80	82	83
71	87	85	83	81	80	81	83	84
72	89	86	84	82	81	82	84	84
73	90	87	85	83	82	83	84	85
74	91	88	86	84	83	84	85	86
75	92	89	87	84	84	84	86	86
76	93	90	88	85	84	85	87	87
77	94	91	89	86	85	86	87	88
78	95	92	90	87	86	87	88	88
79	97	93	91	88	87	88	89	89
80	98	94	92	89	88	89	90	90
81	99	95	93	90	89	90	91	90
82	100	96	94	91	90	90	91	91
83	101	97	95	92	91	91	92	92
84	102	99	96	93	92	92	93	92
85	103	100	97	94	93	93	94	93
86	105	101	98	95	94	94	95	94
87	106	102	99	96	95	95	95	94
88	107	103	100	97	96	96	96	95
89	108	104	101	98	97	97	97	96
90	109	105	102	99	98	98	98	97
91	110	106	103	100	99	98	99	97
92	111	107	104	101	99	99	100	98
93	112	108	105	102	100	100	100	99

OMEGA POINT LABORATORIES

Time (min)	Conduit #5 Bare #8 TC No. 161 (°F)	Conduit #5 Bare #8 TC No. 162 (°F)	Conduit #5 Bare #8 TC No. 163 (°F)	Conduit #5 Bare #8 TC No. 164 (°F)	Conduit #5 Bare #8 TC No. 165 (°F)	Conduit #5 Bare #8 TC No. 166 (°F)	Conduit #5 Bare #8 TC No. 167 (°F)	Conduit #5 Bare #8 TC No. 168 (°F)
94	113	109	106	103	101	101	101	99
95	114	110	107	104	102	102	102	100
96	115	111	108	105	103	103	103	101
97	116	112	110	106	104	104	104	102
98	117	113	111	107	105	105	105	102
99	118	114	112	108	106	106	105	103
100	119	116	113	110	107	107	106	104
101	120	117	114	111	108	108	107	105
102	121	118	115	112	109	109	108	105
103	123	119	116	113	110	110	109	106
104	124	120	117	114	111	111	110	107
105	125	121	118	115	112	111	111	108
106	126	122	119	116	113	112	112	108
107	127	123	121	117	114	113	113	109
108	128	124	122	118	115	114	114	110
109	129	125	123	119	117	115	115	111
110	130	127	124	120	118	117	116	112
111	131	128	125	122	119	118	116	113
112	132	129	126	123	120	119	118	114
113	134	130	128	124	121	120	119	115
114	135	131	129	125	122	121	120	116
115	136	132	130	126	123	122	121	116
116	137	133	131	127	124	123	122	118
117	138	134	132	128	125	124	123	119
118	139	135	133	129	126	125	124	120
119	140	136	134	130	127	126	125	121
120	141	137	135	131	128	127	126	122
121	141	138	136	132	129	128	127	123
122	142	139	137	134	131	129	128	124
123	143	140	138	135	132	130	129	125
124	144	141	139	136	133	132	130	126
125	145	142	140	137	134	133	132	127
126	147	143	141	138	135	134	133	129
127	148	145	143	139	136	135	134	130
128	149	146	144	140	137	136	135	131
129	150	147	145	141	139	138	137	132
130	151	149	146	143	140	139	138	134
131	152	150	148	144	141	140	139	135
132	154	152	149	145	143	142	141	136
133	155	153	150	147	144	143	142	138
134	156	155	152	148	145	144	143	139
135	158	156	153	149	147	146	145	140
136	159	158	155	151	148	147	146	141
137	160	159	156	152	149	148	148	143
138	162	161	158	154	151	150	149	144
139	163	162	159	155	152	151	150	145
140	164	164	160	156	154	153	151	146

Time (min)	Conduit #5 Bare #8 TC No. 161 (°F)	Conduit #5 Bare #8 TC No. 162 (°F)	Conduit #5 Bare #8 TC No. 163 (°F)	Conduit #5 Bare #8 TC No. 164 (°F)	Conduit #5 Bare #8 TC No. 165 (°F)	Conduit #5 Bare #8 TC No. 166 (°F)	Conduit #5 Bare #8 TC No. 167 (°F)	Conduit #5 Bare #8 TC No. 168 (°F)
141	166	165	162	158	155	154	153	147
142	167	166	163	159	156	155	154	148
143	168	168	165	161	158	157	155	149
144	170	169	166	162	159	158	157	150
145	171	170	168	164	161	160	158	151
146	173	172	169	165	162	161	159	151
147	174	173	170	166	163	162	160	151
148	175	174	171	167	165	163	161	153
149	176	175	172	169	166	165	162	153
150	178	177	174	170	167	166	163	154
151	179	178	175	171	169	167	164	156
152	180	179	176	173	170	168	163	157
153	181	179	177	174	171	169	164	158
154	182	180	178	175	172	170	164	159
155	183	181	179	176	173	170	165	162
156	185	182	180	177	174	170	166	162
157	186	182	180	178	175	170	167	164
158	187	183	180	179	176	171	168	166
159	188	183	181	180	177	174	169	166
160	189	184	183	181	178	173	170	168
161	190	185	184	182	179	173	171	169
162	191	186	185	182	179	175	172	170
163	192	186	186	182	178	177	173	171
164	194	187	186	183	179	176	174	172
165	193	187	186	183	181	178	175	174
166	190	187	187	184	181	179	176	174
167	190	188	187	184	182	180	177	177
168	191	189	188	185	182	180	178	176
169	192	189	189	185	184	181	178	179
170	196	190	189	186	184	182	179	180
171	199	190	190	187	186	184	180	180
172	198	191	191	188	187	184	181	181
173	199	192	192	189	188	185	181	181
174	201	193	194	190	188	185	183	182
175	204	195	195	190	189	186	183	183
176	206	197	195	191	189	186	184	184
177	208	200	196	192	189	187	184	184
178	210	202	196	192	189	188	185	185
179	212	203	196	192	190	187	185	185
180	213	202	197	193	190	188	185	185

OMEGA POINT LABORATORIES

PCI/Promatec Project No. 8610-102570 March 19, 1998

Time (min)	Conduit #10 Bare #8 TC No. 169 (°F)	Conduit #10 Bare #8 TC No. 170 (°F)	Conduit #10 Bare #8 TC No. 171 (°F)	Conduit #10 Bare #8 TC No. 172 (°F)	Conduit #10 Bare #8 TC No. 173 (°F)	Conduit #10 Bare #8 TC No. 174 (°F)	Conduit #10 Bare #8 TC No. 175 (°F)
0	66	66	66	66	65	66	66
1	66	66	66	66	65	66	66
2	66	66	66	66	65	66	66
3	66	66	66	66	65	66	66
4	66	66	66	66	66	66	66
5	65	66	66	66	66	66	66
6	65	66	66	66	66	66	66
7	65	66	66	66	65	66	66
8	65	66	66	66	66	66	66
9	65	66	66	66	66	66	66
10	65	66	66	66	66	66	66
11	65	66	66	66	66	66	66
12	65	66	68	68	66	66	66
13	65	66	71	72	67	66	66
14	66	67	75	77	69	66	66
15	66	68	81	83	71	67	66
16	66	70	86	90	75	69	66
17	67	72	91	96	80	71	67
18	67	75	95	102	86	74	68
19	68	77	99	107	91	77	69
20	69	79	102	111	96	81	70
21	70	80	105	116	101	84	71
22	71	82	108	120	105	88	73
23	71	84	110	123	109	91	74
24	72	85	113	127	113	94	76
25	73	87	117	130	117	97	78
26	74	89	121	133	120	100	79
27	75	92	125	136	123	102	81
28	76	95	129	139	126	105	82
29	78	98	133	141	128	107	84
30	80	102	137	144	130	108	85
31	83	107	140	145	131	110	87
32	87	111	143	147	133	111	88
33	90	116	145	149	134	112	89
34	94	120	147	150	134	113	90
35	97	123	150	151	135	114	91
36	101	127	152	152	135	114	92
37	104	130	153	153	136	115	93
38	107	133	155	154	136	116	94
39	109	136	157	155	137	116	95
40	112	138	158	156	137	117	96
41	115	140	159	157	138	117	96
42	117	143	161	157	138	118	97
43	120	145	162	158	139	118	98
44	122	147	164	159	139	119	99
45	125	149	165	160	140	120	100
46	127	151	166	161	141	120	101

OMEGA POINT LABORATORIES

Time (min)	Conduit #10 Bare #8 TC No. 169 (°F)	Conduit #10 Bare #8 TC No. 170 (°F)	Conduit #10 Bare #8 TC No. 171 (°F)	Conduit #10 Bare #8 TC No. 172 (°F)	Conduit #10 Bare #8 TC No. 173 (°F)	Conduit #10 Bare #8 TC No. 174 (°F)	Conduit #10 Bare #8 TC No. 175 (°F)
47	130	153	168	162	141	121	102
48	132	155	169	163	142	122	103
49	135	157	171	164	143	123	104
50	137	159	172	166	144	124	106
51	139	161	173	167	145	125	107
52	142	163	175	168	146	126	109
53	144	165	176	169	147	128	110
54	147	166	177	170	149	129	112
55	149	168	178	171	150	131	114
56	152	170	179	172	151	132	116
57	154	171	180	173	152	134	118
58	156	173	181	174	154	136	121
59	159	174	182	175	155	138	123
60	161	175	182	176	156	139	126
61	163	177	183	176	158	141	129
62	165	178	184	177	159	143	133
63	167	179	185	178	160	146	136
64	169	180	185	179	162	148	140
65	171	181	186	179	163	150	144
66	173	182	187	180	164	153	148
67	175	183	187	181	166	155	152
68	177	184	188	182	167	158	157
69	178	185	189	183	169	161	161
70	180	186	189	183	170	164	165
71	181	187	190	184	172	168	169
72	183	188	190	185	174	171	173
73	184	189	191	186	176	174	176
74	185	190	192	187	178	177	179
75	186	190	192	188	180	180	182
76	188	191	193	189	182	182	185
77	189	192	194	190	184	185	187
78	190	193	195	191	186	187	189
79	192	194	196	192	188	189	191
80	193	195	197	194	189	191	193
81	194	196	198	195	191	192	195
82	195	197	199	196	193	194	196
83	196	198	200	197	194	196	198
84	198	199	200	198	196	197	199
85	199	200	201	199	197	199	201
86	200	201	202	200	198	200	202
87	201	201	203	201	199	201	203
88	202	202	203	202	201	202	204
89	203	203	204	203	202	203	205
90	203	204	205	203	202	204	206
91	204	205	205	204	203	205	206
92	205	205	206	205	204	205	207
93	206	206	206	206	205	206	207

OMEGA POINT LABORATORIES

Time (min)	Conduit #10 Bare #8 TC No. 169 (°F)	Conduit #10 Bare #8 TC No. 170 (°F)	Conduit #10 Bare #8 TC No. 171 (°F)	Conduit #10 Bare #8 TC No. 172 (°F)	Conduit #10 Bare #8 TC No. 173 (°F)	Conduit #10 Bare #8 TC No. 174 (°F)	Conduit #10 Bare #8 TC No. 175 (°F)
94	206	206	207	206	206	206	208
95	207	207	207	207	206	207	208
96	207	207	208	207	207	207	208
97	208	208	208	208	207	208	209
98	208	208	209	209	208	209	209
99	209	209	209	209	209	209	210
100	209	209	210	210	209	209	210
101	210	210	210	210	209	209	210
102	210	210	210	210	209	209	210
103	210	210	210	210	210	210	210
104	210	210	211	211	210	210	210
105	210	210	211	211	210	210	210
106	209	210	211	211	210	210	210
107	209	210	211	211	210	210	210
108	209	210	211	212	210	210	210
109	209	210	211	212	210	210	210
110	209	209	211	212	211	210	210
111	209	209	211	212	211	210	210
112	209	209	211	213	211	210	211
113	209	209	210	213	211	210	211
114	209	209	210	213	211	211	211
115	209	209	210	213	211	211	211
116	209	209	210	212	211	211	211
117	209	209	210	212	211	211	211
118	209	209	210	210	211	211	211
119	209	209	210	210	211	211	211
120	210	209	210	210	211	211	211
121	210	210	210	210	211	211	211
122	210	210	210	210	211	211	211
123	210	210	210	211	211	211	212
124	210	210	210	211	211	211	212
125	210	210	210	211	211	211	212
126	210	210	210	211	211	211	212
127	210	210	210	211	211	211	212
128	210	210	210	211	211	211	212
129	210	210	210	211	211	211	212
130	210	210	210	212	211	211	212
131	210	210	210	212	211	211	212
132	211	211	211	212	212	212	212
133	210	210	210	212	212	212	212
134	211	211	211	212	212	212	212
135	212	212	212	213	213	212	213
136	212	212	212	212	213	212	213
137	212	212	211	212	213	212	213
138	212	212	211	212	213	212	213
139	212	211	211	212	212	212	213
140	212	212	211	212	212	213	213

Time (min)	Conduit #10 Bare #8 TC No. 169 (°F)	Conduit #10 Bare #8 TC No. 170 (°F)	Conduit #10 Bare #8 TC No. 171 (°F)	Conduit #10 Bare #8 TC No. 172 (°F)	Conduit #10 Bare #8 TC No. 173 (°F)	Conduit #10 Bare #8 TC No. 174 (°F)	Conduit #10 Bare #8 TC No. 175 (°F)
141	212	212	211	212	212	212	214
142	211	211	211	211	212	212	213
143	212	212	211	212	212	212	213
144	212	211	211	212	212	212	212
145	211	211	211	212	212	212	212
146	212	212	211	212	212	212	213
147	212	212	211	212	212	212	213
148	211	211	211	211	211	211	213
149	210	211	211	211	211	211	213
150	209	210	209	210	210	210	214
151	206	208	207	209	209	209	214
152	203	205	205	207	207	207	215
153	203	205	205	210	209	207	217
154	199	202	203	219	212	209	219
155	196	199	206	226	218	216	222
156	196	197	214	232	222	221	225
157	185	189	219	237	227	225	227
158	180	185	223	242	230	228	230
159	185	187	228	246	234	231	232
160	195	196	233	251	237	234	235
161	202	205	238	255	240	237	237
162	207	210	243	259	243	239	240
163	210	214	247	262	246	242	242
164	212	217	251	266	249	245	244
165	214	220	254	270	253	248	247
166	216	222	257	273	256	250	249
167	218	224	261	277	259	253	252
168	220	227	264	280	262	256	255
169	222	229	267	283	265	259	257
170	224	231	270	286	268	261	260
171	226	233	273	290	271	264	262
172	228	236	276	293	274	267	265
173	230	238	279	296	277	270	268
174	232	241	282	299	280	273	271
175	234	244	285	302	283	275	273
176	237	246	288	305	286	278	276
177	239	249	290	308	288	281	280
178	242	252	294	311	292	284	282
179	244	255	297	314	295	287	285
180	247	258	301	317	298	290	287

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Time (min)	Conduit #10 Bare #8 TC No. 176 (°F)	Conduit #10 Bare #8 TC No. 177 (°F)	Conduit #10 Bare #8 TC No. 178 (°F)	Conduit #10 Bare #8 TC No. 179 (°F)	JB#1 TC No. 189 (°F)	JB#1 TC No. 190 (°F)	JB#1 TC No. 191 (°F)	JB#1 TC No. 192 (°F)	JB#1 TC No. 193 (°F)
0	66	66	66	66	68	68	68	68	68
1	66	66	66	66	68	68	68	68	68
2	66	66	66	66	68	68	68	68	68
3	66	66	66	66	68	68	68	68	68
4	66	66	66	66	68	68	68	68	68
5	66	66	66	66	68	68	68	68	68
6	66	66	66	66	68	68	68	68	68
7	66	66	66	66	68	68	68	68	68
8	66	66	66	66	68	68	68	68	68
9	66	66	66	66	68	68	68	68	68
10	66	66	66	66	68	68	68	68	68
11	66	66	66	66	68	68	68	68	68
12	66	66	66	66	68	68	68	68	68
13	66	66	66	66	68	68	68	68	68
14	66	66	66	66	68	68	68	68	68
15	66	66	66	66	68	68	68	68	68
16	66	66	66	67	68	68	68	68	68
17	66	66	67	67	68	68	68	68	68
18	66	66	67	68	68	68	68	68	68
19	66	66	67	68	68	68	68	68	68
20	67	67	68	69	68	68	68	68	68
21	67	67	68	69	68	68	68	68	68
22	68	67	69	70	68	68	68	68	68
23	68	68	70	71	68	68	68	68	68
24	69	68	70	72	68	68	68	68	68
25	70	68	71	74	68	68	69	68	68
26	70	69	72	75	68	68	68	68	68
27	71	69	73	77	68	68	69	68	68
28	72	70	74	78	68	68	69	68	68
29	73	71	74	79	68	69	69	69	68
30	74	71	75	80	69	69	69	69	68
31	75	72	76	82	69	69	69	69	68
32	75	72	77	84	69	69	69	69	68
33	76	73	78	86	69	70	69	69	68
34	77	74	80	88	69	71	69	69	69
35	78	75	81	90	69	73	70	69	69
36	79	76	83	93	70	78	70	69	69
37	80	77	85	96	70	83	70	70	69
38	81	79	87	99	70	89	71	71	69
39	82	80	89	102	71	95	72	72	69
40	83	81	92	105	72	101	73	73	70
41	84	83	94	108	73	107	74	75	70
42	85	85	97	112	74	112	75	77	71
43	87	87	100	116	76	116	77	79	71
44	88	89	103	120	78	121	79	81	72
45	89	91	106	124	80	125	80	83	72
46	91	93	109	128	82	128	82	86	73

OMEGA POINT LABORATORIES

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Time (min)	Conduit #10 Bare #8 TC No. 176 (°F)	Conduit #10 Bare #8 TC No. 177 (°F)	Conduit #10 Bare #8 TC No. 178 (°F)	Conduit #10 Bare #8 TC No. 179 (°F)	JB#1 TC No. 189 (°F)	JB#1 TC No. 190 (°F)	JB#1 TC No. 191 (°F)	JB#1 TC No. 192 (°F)	JB#1 TC No. 193 (°F)
47	92	96	113	132	85	131	84	88	74
48	94	99	117	137	88	133	86	91	75
49	95	102	120	141	91	135	88	94	76
50	97	105	124	144	94	136	90	96	76
51	99	109	128	148	96	136	92	98	77
52	102	112	132	150	99	135	94	101	78
53	104	116	136	153	101	135	96	102	79
54	106	120	140	156	103	134	98	104	81
55	109	124	144	159	104	132	99	106	82
56	112	129	148	162	105	131	101	107	83
57	115	133	152	164	107	128	102	108	84
58	119	137	155	166	107	126	104	109	85
59	122	142	159	168	108	124	105	110	86
60	126	146	162	170	109	122	106	111	87
61	130	150	165	172	110	121	107	112	88
62	134	154	168	173	110	119	108	112	89
63	139	158	170	175	111	118	109	113	90
64	143	161	173	176	112	117	109	114	91
65	147	165	175	178	112	116	110	114	92
66	152	168	178	179	113	115	111	115	93
67	156	171	180	180	113	114	112	115	94
68	160	174	181	181	114	113	113	116	95
69	164	176	183	182	114	113	113	116	96
70	168	179	185	184	115	113	114	117	97
71	171	181	186	185	116	113	115	117	98
72	175	183	188	186	116	113	116	118	99
73	178	186	189	187	117	113	116	119	100
74	181	187	190	188	117	114	117	119	100
75	183	189	192	189	118	114	118	120	101
76	186	191	193	190	119	115	119	121	102
77	188	192	194	191	119	115	120	121	103
78	190	194	195	192	120	116	121	122	104
79	192	196	196	193	121	116	122	123	105
80	194	197	198	194	122	117	123	124	106
81	195	199	199	196	122	117	124	124	107
82	197	200	200	198	123	118	125	125	108
83	199	201	201	200	124	118	126	126	109
84	200	202	203	202	125	119	127	127	110
85	201	204	204	204	126	120	128	128	111
86	203	205	205	206	126	120	129	129	112
87	204	206	206	207	127	121	130	130	113
88	205	206	207	207	128	122	131	130	114
89	205	207	208	208	129	122	132	131	115
90	206	207	208	209	130	123	133	132	116
91	207	208	209	210	131	124	134	133	117
92	207	208	209	210	131	125	135	134	118
93	208	209	209	211	132	126	136	135	119

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PCI/Promatec Project No. 8610-102570 March 19, 1998

Time (min)	Conduit #10 Bare #8 TC No. 176 (°F)	Conduit #10 Bare #8 TC No. 177 (°F)	Conduit #10 Bare #8 TC No. 178 (°F)	Conduit #10 Bare #8 TC No. 179 (°F)	JB#1 TC No. 189 (°F)	JB#1 TC No. 190 (°F)	JB#1 TC No. 191 (°F)	JB#1 TC No. 192 (°F)	JB#1 TC No. 193 (°F)
94	208	209	210	211	133	126	137	136	120
95	208	210	210	212	134	127	138	137	121
96	209	210	211	212	135	128	139	138	123
97	209	210	211	212	136	129	140	139	124
98	210	210	211	213	137	130	141	140	125
99	210	210	211	213	138	131	142	140	126
100	210	211	212	214	139	132	143	141	128
101	210	211	212	214	140	133	144	142	129
102	210	211	212	215	141	133	146	143	130
103	210	211	213	216	142	134	147	144	131
104	210	211	213	217	143	135	148	145	133
105	210	211	214	218	144	136	149	146	134
106	210	211	214	219	145	137	150	147	135
107	210	212	215	220	146	138	151	147	137
108	211	212	216	222	147	139	152	148	138
109	211	212	216	224	148	140	153	149	139
110	211	212	217	225	149	141	154	150	141
111	211	212	218	227	150	142	155	151	142
112	211	213	219	229	151	144	156	152	143
113	211	213	220	231	152	145	157	153	145
114	211	213	221	233	153	146	158	153	146
115	211	214	223	235	154	147	159	154	147
116	212	214	224	237	156	148	160	155	149
117	212	215	225	240	157	149	161	156	150
118	212	215	226	242	158	150	162	157	151
119	212	216	228	244	159	151	163	158	152
120	212	216	229	246	160	152	165	159	154
121	212	216	231	249	161	153	166	160	155
122	212	217	232	251	162	155	167	161	156
123	213	217	233	253	164	156	168	161	157
124	213	218	235	256	165	157	169	162	158
125	213	219	237	258	166	158	170	163	159
126	213	219	238	261	167	159	171	164	160
127	213	220	240	263	168	160	172	165	161
128	214	220	241	266	169	161	173	166	162
129	214	221	243	268	170	163	174	167	163
130	214	221	245	271	171	164	175	168	164
131	214	222	247	274	172	165	177	169	166
132	214	223	249	276	173	166	178	169	167
133	215	223	250	279	174	167	179	170	168
134	215	224	252	282	176	168	180	171	169
135	215	225	254	284	177	169	181	172	170
136	216	226	256	287	178	169	182	173	171
137	216	226	258	290	179	170	183	174	172
138	216	227	259	292	180	171	184	175	173
139	216	228	261	295	181	172	185	176	174
140	217	229	263	298	182	173	186	177	174

OMEGA POINT LABORATORIES

Time (min)	Conduit #10 Bare #8 TC No. 176 (°F)	Conduit #10 Bare #8 TC No. 177 (°F)	Conduit #10 Bare #8 TC No. 178 (°F)	Conduit #10 Bare #8 TC No. 179 (°F)	JB#1 TC No. 189 (°F)	JB#1 TC No. 190 (°F)	JB#1 TC No. 191 (°F)	JB#1 TC No. 192 (°F)	JB#1 TC No. 193 (°F)
141	217	230	265	301	183	174	186	178	175
142	217	231	268	303	184	175	187	178	176
143	217	232	269	306	185	176	188	179	177
144	218	233	271	309	186	177	189	180	178
145	218	234	273	311	187	177	190	181	179
146	218	235	275	314	189	178	191	182	180
147	219	236	277	316	190	179	192	183	181
148	219	236	279	319	191	180	193	184	182
149	220	237	280	321	192	182	194	185	183
150	220	238	282	323	193	183	195	186	184
151	221	239	284	326	195	184	196	187	186
152	222	240	285	328	196	185	197	187	187
153	223	242	287	330	197	186	199	189	188
154	224	243	289	333	199	188	200	190	189
155	226	245	291	336	200	189	201	191	190
156	228	247	294	338	202	190	202	192	192
157	230	249	297	341	203	192	203	193	193
158	232	251	300	344	205	193	205	194	194
159	234	254	303	347	206	195	206	195	196
160	236	256	306	350	208	196	207	196	197
161	239	259	309	353	210	198	209	198	198
162	241	261	312	356	211	199	210	199	200
163	243	264	315	359	213	201	211	200	201
164	246	267	318	362	215	202	213	202	203
165	248	269	321	365	216	204	214	203	204
166	251	272	323	367	218	206	216	204	206
167	253	275	326	370	220	207	217	206	208
168	256	278	329	373	221	209	219	207	209
169	258	281	332	375	223	211	220	209	211
170	261	283	335	378	225	212	221	210	212
171	264	286	338	380	227	214	222	212	214
172	266	289	341	383	229	215	224	213	216
173	269	292	344	385	230	217	226	215	217
174	272	295	347	388	232	219	227	216	219
175	275	298	349	391	234	221	229	218	221
176	278	301	352	393	236	222	231	219	222
177	280	304	355	397	238	224	233	221	224
178	283	307	358	398	240	226	234	223	226
179	286	310	361	400	242	228	236	225	228
180	289	313	363	403	243	229	238	226	229

Time (min)	JB#3 TC No. 194 (°F)	JB#3 TC No. 195 (°F)	JB#3 TC No. 196 (°F)	JB#3 TC No. 197 (°F)	JB#3 TC No. 198 (°F)	JB#3 TC No. 199 (°F)	JB#3 TC No. 200 (°F)	JB#3 TC No. 201 (°F)	JB#3 TC No. 202 (°F)	JB#3 TC No. 203 (°F)	JB#3 TC No. 204 (°F)
0	66	66	66	66	66	66	66	66	66	66	66
1	66	66	66	66	66	66	66	66	66	66	66
2	66	66	66	66	66	66	66	66	66	66	66
3	66	66	66	66	66	66	66	66	66	66	66
4	66	66	66	66	66	66	66	66	66	66	66
5	66	66	66	66	66	66	66	66	66	66	66
6	66	66	66	66	66	66	66	66	66	66	66
7	66	66	66	66	66	66	66	66	66	66	66
8	66	66	66	66	66	66	66	66	66	66	66
9	66	66	66	66	66	66	66	66	66	66	66
10	66	66	66	66	66	66	66	66	66	66	66
11	66	66	66	66	66	67	66	67	66	66	66
12	66	66	66	66	66	67	67	67	66	66	66
13	66	66	66	66	66	68	68	68	66	66	66
14	66	66	66	66	66	68	68	69	66	66	66
15	66	66	66	66	66	69	70	70	66	66	66
16	66	66	66	66	67	70	71	72	67	66	66
17	66	66	67	66	67	70	73	74	67	66	66
18	66	67	67	67	67	71	74	76	67	66	67
19	66	67	67	67	67	72	76	77	68	66	67
20	67	67	67	67	67	73	78	79	68	66	67
21	67	67	67	67	67	74	79	81	68	66	67
22	67	67	67	67	68	75	81	83	69	67	67
23	67	67	67	67	68	77	83	84	69	67	67
24	67	67	67	67	68	78	84	86	70	67	68
25	67	67	67	67	68	79	86	87	70	67	68
26	67	67	67	67	69	80	88	88	71	67	68
27	67	67	68	67	69	81	89	90	71	67	68
28	67	67	68	68	69	82	91	91	72	67	69
29	67	67	68	68	70	83	92	92	72	67	69
30	68	68	68	68	70	84	93	93	73	68	69
31	68	68	68	68	70	85	95	94	73	68	70
32	68	68	69	68	71	86	96	95	74	68	70
33	68	68	69	68	71	87	98	96	74	68	71
34	68	68	69	68	72	88	99	97	75	68	71
35	69	68	69	69	72	89	100	98	75	69	72
36	69	69	69	69	72	90	101	99	75	69	74
37	69	69	70	69	73	91	102	100	76	69	76
38	69	69	70	69	73	91	103	101	76	70	79
39	69	69	70	70	74	92	104	102	77	70	82
40	70	70	71	70	74	93	104	103	77	71	85
41	70	70	71	70	75	94	105	104	78	72	88
42	70	70	71	71	75	96	106	105	78	72	90
43	71	70	72	71	76	97	106	106	79	73	93
44	71	71	72	71	76	98	107	107	79	74	95
45	71	71	72	72	77	99	108	108	80	75	97
46	72	71	73	72	77	100	109	109	81	76	99

OMEGA POINT LABORATORIES

PCI/Promatec Project No. 8610-102570 March 19, 1998

Time (min)	JB#3 TC No. 194 (°F)	JB#3 TC No. 195 (°F)	JB#3 TC No. 196 (°F)	JB#3 TC No. 197 (°F)	JB#3 TC No. 198 (°F)	JB#3 TC No. 199 (°F)	JB#3 TC No. 200 (°F)	JB#3 TC No. 201 (°F)	JB#3 TC No. 202 (°F)	JB#3 TC No. 203 (°F)	JB#3 TC No. 204 (°F)
47	72	72	73	72	78	101	109	110	81	77	102
48	73	72	74	73	79	102	110	111	82	78	104
49	73	73	74	73	79	103	111	112	82	78	105
50	74	73	75	74	80	104	112	113	83	79	107
51	74	74	75	74	81	105	113	114	84	80	109
52	75	74	76	75	81	106	114	115	84	81	111
53	75	75	76	76	82	107	115	117	85	82	113
54	76	75	77	76	83	108	116	118	86	83	115
55	76	76	77	77	84	109	117	119	86	84	116
56	77	77	78	77	84	110	118	120	87	85	118
57	78	77	79	78	85	111	119	121	88	86	120
58	78	78	79	79	86	112	120	122	89	87	121
59	79	79	80	79	87	114	121	123	90	88	123
60	80	79	81	80	87	115	122	124	90	89	125
61	80	80	81	81	88	116	123	125	91	90	126
62	81	81	82	82	89	117	124	127	92	91	128
63	82	82	83	83	90	118	125	128	93	92	129
64	83	83	84	83	91	119	126	129	94	93	130
65	83	83	84	84	92	120	127	131	95	94	132
66	84	84	85	85	93	122	128	132	96	95	133
67	85	85	86	86	94	123	129	134	97	96	134
68	86	86	87	87	95	124	130	135	98	98	135
69	87	87	88	88	96	125	131	136	99	99	137
70	88	88	89	89	97	126	132	138	100	100	138
71	89	89	90	90	98	127	133	139	101	101	139
72	90	90	91	91	99	128	134	140	102	102	140
73	91	91	92	92	100	129	135	142	103	103	141
74	92	92	93	93	101	130	136	143	104	104	142
75	93	93	94	94	102	131	137	144	106	105	143
76	94	94	95	95	103	132	138	145	107	106	144
77	95	95	96	96	104	133	139	146	108	108	145
78	96	97	97	97	106	134	140	147	109	109	146
79	97	98	98	98	107	135	141	148	110	110	147
80	98	99	99	99	108	136	142	149	111	111	148
81	100	100	100	101	109	137	143	151	112	112	149
82	101	101	101	102	110	138	145	153	113	113	150
83	102	102	102	103	111	139	146	155	115	115	151
84	103	104	103	104	112	140	147	157	116	116	152
85	104	105	105	105	114	141	148	158	117	117	153
86	106	106	106	107	115	142	149	160	119	118	154
87	107	107	107	108	116	143	150	163	120	119	155
88	108	109	108	109	117	144	151	167	122	121	156
89	110	110	110	110	119	145	152	170	123	122	157
90	111	111	111	112	120	147	153	171	125	123	158
91	112	113	112	113	121	148	154	174	127	125	159
92	114	114	113	114	123	149	155	176	129	126	160
93	115	116	115	116	124	150	157	178	131	127	162

OMEGA POINT LABORATORIES

Time (min)	JB#3 TC No. 194 (°F)	JB#3 TC No. 195 (°F)	JB#3 TC No. 196 (°F)	JB#3 TC No. 197 (°F)	JB#3 TC No. 198 (°F)	JB#3 TC No. 199 (°F)	JB#3 TC No. 200 (°F)	JB#3 TC No. 201 (°F)	JB#3 TC No. 202 (°F)	JB#3 TC No. 203 (°F)	JB#3 TC No. 204 (°F)
94	116	117	116	117	125	151	158	181	133	128	163
95	118	118	118	119	127	152	159	182	135	130	164
96	119	120	119	120	128	153	160	184	137	131	165
97	121	121	121	121	129	155	162	185	139	132	166
98	122	123	122	123	131	156	163	188	141	134	168
99	124	124	124	124	132	157	164	190	143	135	169
100	125	126	125	126	134	158	165	190	145	137	170
101	127	127	127	127	135	160	166	193	147	138	171
102	128	129	128	129	137	163	168	196	149	139	172
103	130	130	130	130	138	167	169	197	151	141	173
104	131	132	131	132	140	171	170	198	153	142	174
105	133	134	133	133	142	174	172	200	156	144	176
106	135	135	135	135	143	179	174	203	158	145	177
107	136	137	136	136	145	184	176	205	161	147	178
108	138	138	138	138	148	189	178	206	164	148	179
109	139	140	140	139	150	192	180	207	167	150	180
110	141	141	142	141	153	196	182	208	171	151	181
111	142	143	144	142	155	199	184	208	176	153	182
112	144	145	146	144	158	200	186	209	181	154	183
113	146	146	148	146	161	203	189	209	186	156	184
114	147	148	150	147	164	206	191	209	192	157	185
115	149	149	153	149	168	207	194	209	197	159	186
116	151	151	155	151	171	208	197	209	203	160	187
117	153	152	158	152	175	208	201	209	207	161	188
118	154	154	160	154	180	209	203	210	208	163	188
119	156	156	163	156	184	209	205	209	209	164	189
120	158	157	166	157	189	209	207	210	209	165	190
121	160	160	168	160	194	209	208	210	209	167	191
122	162	162	171	162	198	210	209	210	209	168	192
123	164	164	173	165	202	210	209	210	209	169	192
124	167	167	176	167	204	210	210	210	209	171	193
125	169	168	178	169	206	210	210	210	209	172	194
126	171	170	180	171	207	210	210	211	209	174	195
127	173	172	183	172	207	210	210	211	209	176	196
128	175	174	185	174	207	210	210	211	209	177	197
129	177	175	187	176	208	210	210	211	209	179	198
130	179	177	189	177	208	210	210	212	209	181	199
131	180	178	190	179	208	210	210	212	209	182	200
132	182	179	192	180	207	210	210	213	209	184	200
133	184	181	193	181	207	210	210	213	209	185	201
134	185	182	194	182	207	211	210	214	209	187	202
135	187	183	196	183	207	211	210	214	209	188	202
136	188	184	197	185	207	211	210	215	209	190	203
137	190	186	198	186	208	211	210	215	209	191	204
138	191	187	199	187	208	212	210	216	209	192	204
139	192	188	200	188	208	212	210	217	209	194	205
140	194	189	201	189	208	212	210	217	209	195	206

OMEGA POINT LABORATORIES

Time (min)	JB#3 TC No. 194 (°F)	JB#3 TC No. 195 (°F)	JB#3 TC No. 196 (°F)	JB#3 TC No. 197 (°F)	JB#3 TC No. 198 (°F)	JB#3 TC No. 199 (°F)	JB#3 TC No. 200 (°F)	JB#3 TC No. 201 (°F)	JB#3 TC No. 202 (°F)	JB#3 TC No. 203 (°F)	JB#3 TC No. 204 (°F)
141	195	190	202	190	208	213	210	218	209	196	206
142	197	192	203	191	208	213	210	218	209	198	206
143	198	193	203	193	209	214	210	219	209	199	207
144	199	194	204	194	209	214	210	219	209	200	207
145	201	195	205	197	209	215	210	220	209	201	208
146	202	196	206	199	209	216	210	221	209	202	208
147	203	197	206	202	210	216	210	221	210	203	209
148	204	198	207	204	210	217	211	222	210	204	209
149	205	200	207	205	210	217	211	222	210	205	210
150	206	201	208	207	210	218	211	223	210	206	210
151	207	203	208	208	210	219	211	224	210	207	210
152	208	205	209	209	210	219	211	224	211	208	211
153	208	207	209	210	211	220	211	225	211	209	211
154	209	208	209	210	211	221	212	226	211	210	212
155	209	210	209	211	211	221	212	227	211	210	212
156	210	211	210	211	211	222	213	227	211	211	213
157	210	212	210	212	211	223	213	228	211	212	214
158	211	213	210	213	211	224	214	229	211	213	214
159	211	214	210	213	211	225	214	230	211	214	215
160	212	215	211	214	211	225	215	230	211	215	216
161	212	216	211	215	211	226	216	231	211	216	217
162	213	217	211	216	211	227	217	232	211	217	218
163	214	218	211	217	211	228	217	233	211	218	218
164	216	219	212	218	211	229	218	234	211	219	219
165	217	220	212	219	211	230	219	235	212	220	220
166	219	221	212	220	212	231	219	236	212	221	221
167	220	222	213	222	212	232	220	236	213	222	221
168	222	224	214	223	213	233	220	237	214	224	222
169	223	225	214	225	215	234	221	238	214	225	223
170	225	226	215	226	218	235	221	239	215	226	224
171	226	228	217	227	221	236	222	240	216	227	225
172	228	229	219	229	224	237	222	241	217	228	226
173	229	230	221	230	226	238	223	242	218	229	227
174	231	232	223	232	228	239	224	243	219	230	227
175	232	233	225	233	229	240	224	244	220	231	228
176	234	235	227	235	231	242	225	245	221	233	229
177	235	236	228	236	232	243	225	246	223	234	230
178	236	237	230	237	234	244	226	247	225	235	231
179	238	239	232	239	235	245	226	248	227	236	232
180	239	240	234	240	237	246	227	249	229	238	233

Time (min)	JB#3 TC No. 205 (°F)	JB#3 TC No. 206 (°F)	JB#3 TC No. 207 (°F)	JB#3 TC No. 208 (°F)	JB#3 TC No. 209 (°F)	JB#3 TC No. 210 (°F)	JB#3 TC No. 211 (°F)	JB#3 TC No. 212 (°F)	JB#3 TC No. 213 (°F)	JB#3 TC No. 214 (°F)	JB#3 TC No. 215 (°F)
0	66	66	66	66	66	66	66	66	66	66	66
1	66	66	66	66	66	66	66	66	66	66	66
2	66	66	66	66	66	66	66	66	66	66	66
3	66	66	66	66	66	66	66	66	66	66	66
4	66	66	66	66	66	66	66	66	66	66	66
5	66	66	66	66	66	66	66	66	66	66	66
6	66	66	66	66	66	66	66	66	66	66	66
7	66	66	66	66	66	66	66	66	66	66	66
8	66	66	66	66	66	66	66	66	66	66	66
9	66	66	66	66	66	66	66	66	66	66	66
10	66	66	66	66	66	66	66	66	66	66	66
11	66	66	66	66	66	66	66	66	66	66	66
12	66	66	66	66	66	66	66	66	66	66	66
13	66	66	66	66	67	66	66	66	66	66	66
14	66	66	66	66	67	67	66	66	66	66	66
15	66	66	66	66	67	67	66	66	66	66	66
16	66	66	66	67	67	67	67	66	66	66	66
17	66	66	66	67	68	67	67	67	67	66	67
18	66	66	66	67	68	67	67	67	67	66	67
19	66	67	66	67	68	68	67	67	67	66	67
20	66	67	66	67	69	68	67	67	67	66	67
21	67	67	67	67	69	68	67	67	67	67	68
22	67	67	67	67	69	69	67	67	67	67	68
23	67	68	67	68	70	69	67	67	67	67	68
24	67	68	67	68	70	69	67	67	67	67	69
25	67	68	67	68	71	70	67	67	67	67	69
26	67	69	67	68	71	70	67	68	68	67	69
27	68	70	67	68	72	70	67	68	68	67	70
28	68	70	68	69	72	71	68	68	68	67	70
29	68	71	68	69	72	71	68	68	68	68	70
30	68	72	68	69	73	71	68	68	69	68	71
31	69	72	68	70	73	72	68	69	69	68	71
32	69	73	68	70	74	72	68	69	69	68	72
33	69	74	69	70	74	73	68	69	69	68	72
34	70	75	69	71	75	73	69	69	70	69	72
35	70	76	69	71	75	74	69	69	70	69	73
36	71	77	70	71	76	74	69	70	70	69	73
37	71	78	70	72	76	74	70	70	71	69	74
38	72	80	70	72	76	75	70	70	71	70	74
39	73	81	71	73	77	75	70	71	72	70	74
40	73	83	71	73	77	76	71	71	72	70	75
41	74	85	72	73	78	76	71	71	73	71	75
42	75	87	73	74	78	77	72	72	73	71	75
43	76	89	73	74	79	77	72	72	74	72	76
44	77	91	74	75	79	78	73	73	74	72	76
45	78	93	75	75	80	78	73	73	75	72	77
46	80	95	75	76	80	79	74	74	76	73	77

OMEGA POINT LABORATORIES

Time (min)	JB#3 TC No. 205 (°F)	JB#3 TC No. 206 (°F)	JB#3 TC No. 207 (°F)	JB#3 TC No. 208 (°F)	JB#3 TC No. 209 (°F)	JB#3 TC No. 210 (°F)	JB#3 TC No. 211 (°F)	JB#3 TC No. 212 (°F)	JB#3 TC No. 213 (°F)	JB#3 TC No. 214 (°F)	JB#3 TC No. 215 (°F)
47	82	96	76	77	81	80	75	74	76	73	77
48	83	98	77	77	82	80	75	75	77	73	78
49	85	100	78	78	82	81	76	76	78	74	78
50	87	101	79	79	83	82	77	76	79	74	78
51	89	103	80	79	84	82	78	77	79	75	79
52	91	104	81	80	84	83	78	78	80	75	79
53	93	106	82	81	85	84	79	78	81	76	80
54	95	107	82	81	86	84	80	79	82	76	80
55	97	108	83	82	86	85	81	80	83	77	81
56	99	109	84	83	87	86	82	81	84	77	81
57	101	111	85	84	88	87	83	82	84	78	82
58	103	112	86	85	89	88	83	82	85	78	82
59	106	113	87	85	89	88	84	83	86	79	83
60	108	114	88	86	90	89	85	84	87	80	84
61	111	115	89	87	91	90	86	85	88	80	84
62	113	116	90	88	92	91	87	86	89	81	85
63	116	117	91	89	93	92	88	87	90	81	85
64	119	118	92	90	94	93	89	88	91	82	86
65	121	120	93	91	95	94	90	89	92	83	87
66	124	121	94	92	95	95	92	90	93	84	87
67	126	122	95	93	96	96	93	92	94	84	88
68	128	124	96	94	97	97	94	93	95	85	89
69	130	125	97	95	98	98	95	94	96	86	90
70	132	126	98	96	99	99	96	95	97	87	90
71	134	127	99	97	100	100	97	96	98	87	91
72	136	129	100	98	101	102	98	97	99	88	92
73	137	130	102	99	102	103	100	99	100	89	93
74	139	131	103	100	103	104	101	100	102	90	94
75	140	132	104	102	104	105	102	101	103	91	94
76	142	134	105	103	105	106	103	102	104	92	95
77	143	135	106	104	106	107	105	103	105	93	96
78	145	136	107	105	107	109	106	104	107	93	97
79	146	137	109	107	108	110	107	106	108	94	98
80	147	139	110	108	110	111	108	107	109	95	99
81	149	140	111	109	111	112	110	108	110	96	100
82	150	141	112	110	112	114	111	109	112	97	101
83	151	143	114	112	113	115	112	110	113	98	102
84	153	144	115	113	114	116	114	112	114	99	103
85	154	145	116	114	115	117	115	113	116	100	103
86	155	146	117	116	117	119	117	114	117	101	104
87	156	147	119	117	118	120	118	115	119	103	105
88	158	149	120	119	119	122	119	117	120	104	106
89	159	150	121	120	120	123	121	118	121	105	107
90	160	151	123	121	122	125	122	119	123	106	108
91	161	152	124	123	123	126	124	121	124	107	109
92	162	153	125	124	124	128	125	122	126	108	110
93	163	155	127	126	126	130	127	123	127	109	111

OMEGA POINT LABORATORIES

Time (min)	JB#3 TC No. 205 (°F)	JB#3 TC No. 206 (°F)	JB#3 TC No. 207 (°F)	JB#3 TC No. 208 (°F)	JB#3 TC No. 209 (°F)	JB#3 TC No. 210 (°F)	JB#3 TC No. 211 (°F)	JB#3 TC No. 212 (°F)	JB#3 TC No. 213 (°F)	JB#3 TC No. 214 (°F)	JB#3 TC No. 215 (°F)
94	164	156	128	127	127	132	128	125	128	111	113
95	166	157	130	129	128	133	130	126	130	112	114
96	167	158	131	130	130	135	131	127	131	113	115
97	168	159	132	132	131	137	133	129	133	114	116
98	169	160	134	133	133	139	134	130	134	116	117
99	170	161	135	135	134	141	136	131	136	117	118
100	171	163	137	136	136	143	138	133	137	118	119
101	172	164	138	138	137	144	139	134	139	120	120
102	173	165	140	139	139	146	141	136	140	121	121
103	174	166	141	141	140	148	142	137	142	122	123
104	176	167	142	143	142	150	144	138	143	124	124
105	177	169	144	144	143	152	145	140	145	125	125
106	178	170	145	146	145	154	147	141	146	126	126
107	179	171	147	148	147	156	149	143	148	128	127
108	180	172	148	149	148	158	150	144	149	129	129
109	181	174	150	151	150	160	152	146	151	131	130
110	182	176	151	153	152	162	153	147	152	132	131
111	183	177	153	155	153	164	155	149	154	134	132
112	184	179	154	157	155	166	156	150	155	135	134
113	185	181	156	159	157	168	158	152	157	137	135
114	186	183	157	161	159	170	159	153	158	138	136
115	187	186	159	164	160	171	161	155	160	140	138
116	188	188	160	166	162	173	162	156	161	141	139
117	189	190	162	168	164	175	164	158	163	143	141
118	190	192	163	170	166	176	165	159	164	144	142
119	191	194	165	172	168	178	167	161	166	146	143
120	192	196	167	173	169	180	168	162	167	147	145
121	193	198	168	175	171	181	169	164	169	149	146
122	193	199	170	177	173	183	171	166	171	150	148
123	194	200	171	179	174	184	172	169	172	152	149
124	195	201	173	181	176	186	174	171	174	154	151
125	196	203	174	182	178	187	175	174	176	155	152
126	197	204	176	184	180	189	177	176	178	157	154
127	198	204	177	186	182	190	179	178	180	158	155
128	198	205	179	187	183	192	181	180	182	160	157
129	199	206	181	189	185	193	182	182	183	162	159
130	200	206	182	191	187	194	184	184	185	163	160
131	200	207	184	192	188	195	186	185	186	165	162
132	201	207	185	193	189	197	187	186	188	166	163
133	201	208	187	195	190	198	189	187	189	168	165
134	202	208	188	196	192	199	190	188	190	170	166
135	202	208	189	197	193	200	191	189	191	171	168
136	203	208	191	199	194	201	193	190	192	173	169
137	203	209	192	200	195	202	194	191	194	174	171
138	204	209	193	201	196	203	196	192	195	175	172
139	204	209	195	202	196	205	197	193	196	177	174
140	204	209	196	203	197	206	198	194	198	178	175

OMEGA POINT LABORATORIES

Time (min)	JB#3 TC No. 205 (°F)	JB#3 TC No. 206 (°F)	JB#3 TC No. 207 (°F)	JB#3 TC No. 208 (°F)	JB#3 TC No. 209 (°F)	JB#3 TC No. 210 (°F)	JB#3 TC No. 211 (°F)	JB#3 TC No. 212 (°F)	JB#3 TC No. 213 (°F)	JB#3 TC No. 214 (°F)	JB#3 TC No. 215 (°F)
141	205	209	197	205	198	206	200	194	199	180	176
142	205	209	198	206	199	207	201	195	201	181	178
143	205	209	199	207	200	208	203	196	202	182	179
144	206	209	200	208	201	209	204	197	203	184	180
145	206	210	202	209	202	210	205	197	204	185	182
146	206	210	203	210	202	211	206	198	206	186	183
147	207	210	204	211	203	212	208	198	207	188	184
148	207	210	204	212	204	213	209	199	208	189	186
149	207	210	205	213	205	214	210	199	209	190	187
150	207	210	206	215	206	215	211	200	210	191	188
151	208	210	207	216	207	216	213	200	212	193	190
152	208	210	208	217	207	217	214	201	213	194	191
153	208	210	209	218	208	218	215	201	214	195	192
154	208	210	210	219	209	219	216	202	215	196	194
155	209	210	211	220	210	220	217	202	216	197	195
156	209	210	212	221	211	221	219	203	217	198	197
157	209	210	213	223	212	222	220	204	218	200	198
158	209	210	213	224	213	223	221	204	220	201	200
159	210	210	214	225	214	224	222	205	221	202	201
160	210	210	215	226	214	225	224	206	222	203	203
161	210	210	216	228	215	226	225	207	223	204	204
162	210	211	217	229	217	227	226	209	224	205	205
163	211	211	217	230	218	229	228	210	225	206	206
164	211	211	218	231	219	230	229	212	226	207	207
165	211	211	219	233	220	231	230	213	227	208	208
166	212	212	220	234	221	232	231	215	229	209	208
167	212	212	221	235	222	233	233	216	230	209	209
168	212	213	222	236	223	234	234	217	231	210	209
169	212	214	223	238	225	236	235	218	232	211	209
170	213	214	224	239	226	237	237	219	233	211	210
171	213	215	225	241	227	238	238	221	235	212	210
172	213	216	226	242	228	239	239	222	236	212	210
173	214	217	227	243	229	240	241	223	237	213	210
174	214	218	229	244	231	242	242	224	238	214	210
175	215	219	230	246	232	243	243	225	239	215	211
176	215	220	231	247	233	244	245	226	241	215	211
177	215	221	232	249	234	245	246	227	242	216	211
178	216	222	233	250	235	247	247	228	243	217	211
179	216	223	235	251	237	248	249	230	244	217	211
180	217	224	236	253	238	249	250	231	246	218	211

Time (min)	JB#3 TC No. 216 (°F)	JB#3 TC No. 217 (°F)	JB#3 TC No. 218 (°F)	JB#3 TC No. 219 (°F)
0	66	66	66	66
1	66	66	66	66
2	66	66	66	66
3	66	66	66	66
4	66	66	66	66
5	66	66	66	66
6	66	66	66	66
7	66	66	66	66
8	66	66	66	66
9	66	66	66	66
10	66	66	66	66
11	66	66	66	66
12	66	66	66	66
13	66	66	66	66
14	66	66	66	66
15	66	66	66	66
16	66	66	66	66
17	67	66	66	66
18	67	66	66	66
19	67	66	66	66
20	67	66	66	66
21	67	66	66	66
22	68	66	66	66
23	68	66	66	66
24	68	67	66	66
25	69	67	66	67
26	69	67	66	67
27	69	67	67	67
28	69	67	67	67
29	70	67	67	67
30	70	67	67	67
31	70	67	67	67
32	71	67	67	67
33	71	67	67	67
34	71	68	67	68
35	72	68	68	68
36	72	68	68	68
37	72	68	68	68
38	72	68	68	68
39	73	68	68	69
40	73	69	69	69
41	73	69	69	69
42	74	69	69	69
43	74	70	69	70
44	75	70	70	70
45	75	71	70	70
46	75	71	70	71

OMEGA POINT LABORATORIES

Time (min)	JB#3 TC No. 216 (°F)	JB#3 TC No. 217 (°F)	JB#3 TC No. 218 (°F)	JB#3 TC No. 219 (°F)
47	76	72	71	71
48	76	72	71	72
49	76	73	72	72
50	77	73	72	73
51	77	74	73	74
52	78	74	74	74
53	78	75	74	75
54	79	76	75	76
55	79	76	76	76
56	80	77	77	77
57	81	78	77	78
58	81	78	78	78
59	82	79	79	79
60	82	80	80	80
61	83	81	81	81
62	84	81	82	81
63	84	82	83	82
64	85	83	84	83
65	86	84	84	84
66	87	85	85	84
67	87	85	86	85
68	88	86	87	86
69	89	87	88	87
70	90	88	89	88
71	91	89	90	89
72	91	90	91	89
73	92	91	92	90
74	93	92	93	91
75	94	92	94	92
76	95	93	95	93
77	96	94	96	94
78	97	95	97	95
79	98	96	98	96
80	99	97	99	97
81	100	98	100	98
82	101	99	102	99
83	102	100	103	100
84	103	101	104	101
85	104	102	105	102
86	105	103	106	103
87	106	104	107	104
88	107	105	108	106
89	108	106	109	107
90	109	107	110	108
91	110	109	111	109
92	111	110	112	110
93	112	111	113	111

OMEGA POINT LABORATORIES

Time (min)	JB#3 TC No. 216 (°F)	JB#3 TC No. 217 (°F)	JB#3 TC No. 218 (°F)	JB#3 TC No. 219 (°F)
94	113	112	114	113
95	114	113	115	114
96	115	114	116	115
97	116	116	118	116
98	118	117	119	117
99	119	118	120	119
100	120	119	121	120
101	121	121	122	121
102	122	122	123	123
103	124	123	125	124
104	125	124	126	125
105	126	126	127	127
106	127	127	128	128
107	129	128	129	129
108	130	130	131	131
109	131	131	132	132
110	133	133	133	134
111	134	134	135	135
112	135	136	136	137
113	137	137	137	138
114	138	139	139	140
115	140	140	140	141
116	141	142	142	143
117	143	143	143	144
118	144	145	145	146
119	146	146	146	147
120	147	147	148	149
121	149	149	149	150
122	151	150	151	152
123	153	151	152	153
124	154	153	153	155
125	156	154	155	156
126	158	156	156	158
127	160	157	157	159
128	161	159	159	160
129	164	160	161	162
130	165	162	162	163
131	167	163	163	165
132	169	165	165	166
133	171	166	166	168
134	172	168	168	169
135	174	169	169	171
136	176	171	170	172
137	177	173	172	174
138	179	174	173	175
139	180	176	174	176
140	182	177	176	178

OMEGA POINT LABORATORIES

Time (min)	JB#3 TC No. 216 (°F)	JB#3 TC No. 217 (°F)	JB#3 TC No. 218 (°F)	JB#3 TC No. 219 (°F)
141	183	179	177	179
142	185	180	178	181
143	186	182	179	182
144	187	183	181	183
145	189	185	182	184
146	190	186	183	186
147	191	188	184	187
148	192	189	185	188
149	193	190	186	190
150	195	192	188	191
151	196	193	189	192
152	197	194	190	194
153	198	195	191	195
154	199	196	193	197
155	200	197	194	199
156	202	198	195	200
157	203	199	197	202
158	204	200	198	203
159	205	201	200	204
160	206	202	201	205
161	207	203	203	206
162	208	205	204	207
163	208	206	205	208
164	209	207	206	208
165	209	207	207	209
166	210	208	207	209
167	210	209	208	210
168	210	210	208	210
169	211	210	209	211
170	211	211	209	212
171	211	212	209	212
172	212	213	210	213
173	212	213	210	213
174	213	214	210	214
175	213	215	210	215
176	213	216	210	216
177	214	217	210	217
178	214	218	210	217
179	215	219	211	218
180	215	220	211	219

OMEGA POINT LABORATORIES

Time (min)	Conduit #2 Surface TC No. 220 (°F)	Conduit #2 Surface TC No. 221 (°F)	Conduit #2 Surface TC No. 222 (°F)	Conduit #2 Surface TC No. 223 (°F)	Conduit #2 Surface TC No. 224 (°F)	Conduit #2 Surface TC No. 225 (°F)	Conduit #2 Surface TC No. 226 (°F)	Conduit #2 Surface TC No. 227 (°F)
0	63	63	63	62	62	62	62	62
1	63	63	63	62	62	62	62	62
2	64	64	64	63	63	63	63	63
3	64	64	64	63	63	63	63	63
4	64	64	64	63	63	63	63	63
5	64	64	64	63	63	63	63	63
6	64	64	64	63	63	63	63	63
7	64	64	64	63	63	63	63	63
8	64	64	64	63	63	63	63	63
9	64	64	64	63	63	63	63	63
10	64	64	64	63	63	63	63	63
11	64	64	64	63	63	63	63	63
12	63	63	62	61	61	61	61	61
13	60	60	59	58	58	58	58	58
14	60	60	59	58	58	59	58	58
15	64	64	64	63	63	63	63	63
16	65	64	64	63	63	63	63	63
17	65	64	64	63	63	63	63	63
18	66	64	64	63	63	63	63	63
19	66	65	64	63	63	63	63	63
20	67	65	64	63	64	64	63	63
21	68	65	64	63	64	64	63	64
22	68	65	64	64	64	64	63	64
23	69	66	65	64	64	64	64	64
24	70	66	65	64	64	64	64	64
25	72	66	65	64	64	64	64	65
26	73	67	65	64	64	64	64	65
27	74	67	66	64	65	65	64	66
28	76	68	66	64	65	65	65	66
29	78	68	66	65	65	65	65	66
30	79	69	66	65	65	65	65	67
31	81	69	67	65	66	66	66	67
32	83	70	67	66	66	66	66	68
33	85	71	67	66	66	66	66	68
34	87	71	68	66	66	66	66	69
35	89	72	68	66	67	67	67	70
36	91	73	69	67	67	67	67	70
37	94	75	70	68	68	68	68	71
38	96	75	70	68	68	68	68	71
39	98	76	70	68	68	68	69	72
40	101	77	71	69	69	68	69	72
41	103	78	71	69	69	69	70	73
42	105	79	72	70	70	70	70	73
43	107	81	73	70	70	70	71	74
44	109	82	74	71	71	71	71	75
45	111	83	74	72	72	71	72	75
46	113	84	75	72	72	72	72	76

Time (min)	Conduit #2 Surface TC No. 220 (°F)	Conduit #2 Surface TC No. 221 (°F)	Conduit #2 Surface TC No. 222 (°F)	Conduit #2 Surface TC No. 223 (°F)	Conduit #2 Surface TC No. 224 (°F)	Conduit #2 Surface TC No. 225 (°F)	Conduit #2 Surface TC No. 226 (°F)	Conduit #2 Surface TC No. 227 (°F)
47	115	86	76	73	73	72	73	77
48	116	87	77	74	73	73	73	78
49	118	88	78	75	74	74	74	79
50	120	89	79	75	75	74	75	79
51	121	91	80	76	76	75	76	80
52	123	92	81	77	76	76	77	81
53	124	93	82	78	77	77	77	82
54	125	94	83	78	78	77	78	82
55	127	95	84	79	79	78	79	83
56	128	96	85	80	79	79	80	84
57	129	98	86	81	80	80	81	85
58	130	99	87	82	81	81	81	86
59	131	100	88	83	82	81	82	87
60	133	101	89	84	83	82	83	88
61	134	102	89	85	84	83	84	88
62	135	103	90	86	85	84	85	89
63	137	105	91	87	86	85	86	90
64	138	106	93	87	86	86	86	91
65	140	107	93	89	87	87	87	92
66	142	108	95	89	88	88	88	93
67	143	109	96	90	89	89	89	94
68	145	111	97	91	90	90	90	95
69	146	112	98	93	91	90	91	96
70	148	114	99	93	92	91	92	97
71	150	116	100	95	93	93	93	98
72	152	118	101	96	95	94	94	99
73	155	120	102	97	95	95	95	99
74	157	123	104	98	97	96	96	100
75	159	126	105	99	98	97	97	101
76	161	129	107	100	99	98	98	102
77	162	133	108	101	100	99	99	103
78	164	136	110	102	101	100	100	104
79	166	140	112	104	102	101	102	106
80	167	143	114	105	104	103	103	107
81	169	147	117	106	105	104	104	108
82	170	150	120	108	106	105	105	109
83	171	153	124	109	107	106	106	110
84	172	156	127	111	108	107	107	111
85	173	158	131	113	110	109	108	112
86	174	161	135	115	111	110	110	113
87	175	162	139	117	113	111	111	114
88	175	164	143	119	114	113	112	115
89	176	166	146	122	116	114	113	117
90	177	167	150	125	117	115	115	118
91	177	168	152	128	119	117	116	119
92	178	169	155	132	121	118	117	120
93	178	170	157	135	123	120	119	121

Time (min)	Conduit #2 Surface TC No. 220 (°F)	Conduit #2 Surface TC No. 221 (°F)	Conduit #2 Surface TC No. 222 (°F)	Conduit #2 Surface TC No. 223 (°F)	Conduit #2 Surface TC No. 224 (°F)	Conduit #2 Surface TC No. 225 (°F)	Conduit #2 Surface TC No. 226 (°F)	Conduit #2 Surface TC No. 227 (°F)
94	178	171	159	139	125	121	120	123
95	179	172	161	143	127	123	122	124
96	179	172	163	147	130	125	123	125
97	179	173	164	150	133	127	125	127
98	180	173	165	153	136	129	126	128
99	180	174	167	156	140	131	128	130
100	180	174	168	159	144	133	130	131
101	180	175	168	161	148	135	131	133
102	181	175	169	163	151	138	134	134
103	181	176	170	165	154	141	136	136
104	181	176	171	167	157	144	138	138
105	182	177	171	168	160	147	140	139
106	182	177	172	169	162	150	142	141
107	182	177	172	170	164	153	145	143
108	182	178	173	172	166	156	147	145
109	183	179	174	173	168	159	150	147
110	184	179	174	174	169	162	153	150
111	184	180	175	174	171	164	155	152
112	184	180	176	176	172	167	158	154
113	185	181	177	176	173	169	160	157
114	185	182	178	177	174	170	163	159
115	186	182	178	178	175	172	165	161
116	186	183	179	179	176	173	167	163
117	187	184	180	179	177	174	169	165
118	187	185	181	180	179	176	171	168
119	188	185	182	181	179	177	173	170
120	189	186	183	182	180	178	175	172
121	189	186	183	183	181	180	176	174
122	190	187	184	183	182	180	178	176
123	190	188	185	184	183	181	179	177
124	191	188	186	185	183	183	181	179
125	192	189	187	186	185	184	182	181
126	193	190	188	187	186	185	184	183
127	193	190	188	187	186	186	185	184
128	193	190	188	188	187	186	185	185
129	194	192	190	189	188	188	187	186
130	195	192	190	189	189	189	188	187
131	196	193	191	190	190	190	190	189
132	196	193	192	191	190	190	190	189
133	196	194	193	192	191	192	191	190
134	197	195	194	193	192	192	192	191
135	197	195	194	193	193	193	193	192
136	198	195	195	194	194	194	194	193
137	197	195	194	193	193	193	193	192
138	197	195	195	194	194	194	194	193
139	198	196	196	194	194	194	194	194
140	198	197	196	195	195	195	195	195

Time (min)	Conduit #2 Surface TC No. 220 (°F)	Conduit #2 Surface TC No. 221 (°F)	Conduit #2 Surface TC No. 222 (°F)	Conduit #2 Surface TC No. 223 (°F)	Conduit #2 Surface TC No. 224 (°F)	Conduit #2 Surface TC No. 225 (°F)	Conduit #2 Surface TC No. 226 (°F)	Conduit #2 Surface TC No. 227 (°F)
141	199	197	197	196	196	196	196	195
142	199	198	198	196	196	196	196	196
143	200	198	198	197	196	197	197	196
144	199	199	199	197	197	197	198	197
145	199	199	199	198	198	198	198	197
146	199	200	200	199	198	198	199	198
147	199	200	200	199	199	199	199	198
148	198	201	201	199	199	199	199	199
149	197	201	201	200	200	199	200	199
150	194	201	201	200	201	200	200	199
151	193	201	202	201	202	201	201	200
152	192	201	202	201	202	201	201	200
153	191	197	202	201	203	202	201	200
154	190	198	202	202	203	203	201	200
155	190	198	202	202	204	203	202	201
156	190	196	201	203	205	204	202	201
157	190	196	200	203	206	204	202	202
158	191	195	200	204	207	205	202	202
159	191	195	199	205	208	207	203	202
160	191	195	200	206	208	207	203	203
161	191	195	200	207	209	208	204	203
162	192	196	200	208	210	209	204	204
163	192	196	200	209	211	210	205	205
164	193	196	200	209	212	211	205	205
165	193	197	200	210	212	207	203	205
166	193	197	200	208	210	205	202	201
167	194	197	200	207	209	205	201	201
168	194	197	201	208	209	205	201	201
169	194	197	201	207	208	204	201	201
170	195	197	201	207	208	204	201	201
171	195	198	201	207	207	203	202	201
172	195	198	201	206	207	203	202	201
173	196	198	201	207	206	203	202	202
174	196	198	202	207	206	203	203	202
175	197	199	202	208	208	204	203	202
176	197	199	202	209	208	204	203	202
177	197	199	202	209	209	206	203	202
178	198	199	203	209	210	206	203	202
179	198	199	203	210	212	207	203	203
180	198	200	203	211	212	207	203	203

Time (min)	Conduit #2 Surface TC No. 228 (°F)	Conduit #2 Surface TC No. 229 (°F)	Conduit #2 Surface TC No. 230 (°F)	Conduit #2 Surface TC No. 231 (°F)	Conduit #2 Surface TC No. 232 (°F)	Conduit #2 Surface TC No. 233 (°F)	Conduit #2 Surface TC No. 234 (°F)	Conduit #2 Surface TC No. 235 (°F)
0	62	61	61	61	61	61	61	61
1	62	62	61	61	61	61	61	61
2	62	62	62	62	62	62	62	62
3	63	63	62	62	62	62	62	62
4	62	62	62	62	62	62	62	62
5	62	62	62	62	62	62	62	62
6	62	62	62	62	62	62	62	62
7	62	62	62	62	62	62	62	62
8	62	62	62	62	62	62	62	62
9	62	62	62	62	62	62	62	62
10	63	63	62	62	62	62	62	62
11	63	63	62	62	62	62	62	62
12	61	61	60	60	60	60	60	60
13	58	58	56	56	55	56	56	56
14	58	58	56	56	56	56	56	56
15	63	64	62	62	62	62	62	61
16	63	64	63	63	62	62	62	62
17	64	65	63	63	62	62	62	62
18	64	66	63	63	62	62	62	62
19	65	68	64	64	62	62	62	62
20	66	69	64	64	63	62	62	62
21	67	70	64	64	63	62	62	62
22	68	71	64	64	63	62	63	62
23	69	73	65	65	63	62	63	62
24	70	74	65	65	63	63	63	62
25	71	75	65	65	63	63	63	62
26	72	77	66	66	63	63	63	62
27	73	78	66	66	63	63	63	63
28	73	79	66	66	63	63	63	62
29	74	80	66	66	63	63	63	62
30	75	82	67	67	64	63	63	63
31	77	83	67	67	64	63	63	63
32	77	85	67	68	64	63	63	62
33	78	86	68	68	64	63	63	62
34	79	87	68	68	64	63	63	62
35	80	88	69	69	64	63	63	63
36	81	89	70	70	64	63	63	63
37	83	90	73	72	65	64	64	63
38	83	91	74	74	65	63	63	63
39	84	91	76	76	66	63	63	63
40	85	92	78	78	66	63	63	63
41	85	93	80	80	67	64	63	63
42	86	94	83	82	68	64	64	63
43	87	95	84	84	68	64	64	63
44	88	96	86	86	69	64	64	63
45	89	97	89	88	70	65	64	63
46	90	99	91	90	71	65	64	63

Time (min)	Conduit #2 Surface TC No. 228 (°F)	Conduit #2 Surface TC No. 229 (°F)	Conduit #2 Surface TC No. 230 (°F)	Conduit #2 Surface TC No. 231 (°F)	Conduit #2 Surface TC No. 232 (°F)	Conduit #2 Surface TC No. 233 (°F)	Conduit #2 Surface TC No. 234 (°F)	Conduit #2 Surface TC No. 235 (°F)
47	91	100	93	92	72	66	64	64
48	92	101	95	94	73	66	65	64
49	93	102	98	97	74	66	65	64
50	94	103	100	98	75	67	65	64
51	95	104	101	100	77	68	66	64
52	95	105	103	102	78	68	66	65
53	96	106	105	104	79	69	66	65
54	97	107	107	105	80	70	67	65
55	98	109	109	107	81	70	67	66
56	99	110	111	109	82	71	68	66
57	100	111	113	111	83	72	68	66
58	101	112	115	113	84	72	69	67
59	102	113	117	115	86	73	69	67
60	103	114	119	116	87	74	70	68
61	104	116	121	118	88	75	70	68
62	105	117	123	120	89	75	71	69
63	106	118	125	122	90	76	72	69
64	107	119	127	123	91	77	72	70
65	108	120	128	124	93	78	73	70
66	109	122	130	126	94	79	74	71
67	110	123	131	127	95	80	74	72
68	111	124	133	129	96	81	75	72
69	112	125	134	130	97	82	76	73
70	113	126	135	131	98	82	77	73
71	114	127	137	132	99	83	77	74
72	115	129	138	134	101	84	79	75
73	116	130	139	135	101	85	79	75
74	117	131	141	136	103	86	80	77
75	118	132	142	137	104	87	81	77
76	119	134	143	138	105	88	82	78
77	120	135	144	139	106	89	82	79
78	121	137	145	140	107	90	83	80
79	122	138	146	141	108	91	84	80
80	123	139	147	142	109	92	85	81
81	124	141	148	143	110	93	86	82
82	125	142	149	145	111	94	87	83
83	127	144	150	146	112	95	88	84
84	127	145	151	147	113	96	89	84
85	129	147	153	148	114	97	90	85
86	130	148	154	149	115	98	90	86
87	131	149	155	150	116	99	91	87
88	132	151	156	151	117	100	92	88
89	133	152	157	152	118	101	93	89
90	134	154	159	153	120	102	94	90
91	136	155	159	154	121	103	95	91
92	136	156	161	156	121	104	96	91
93	138	158	162	156	122	105	97	92

Time (min)	Conduit #2 Surface TC No. 228 (°F)	Conduit #2 Surface TC No. 229 (°F)	Conduit #2 Surface TC No. 230 (°F)	Conduit #2 Surface TC No. 231 (°F)	Conduit #2 Surface TC No. 232 (°F)	Conduit #2 Surface TC No. 233 (°F)	Conduit #2 Surface TC No. 234 (°F)	Conduit #2 Surface TC No. 235 (°F)
94	139	159	163	158	124	106	98	93
95	140	161	164	159	125	107	99	94
96	141	162	165	160	126	108	100	95
97	143	163	167	161	127	109	101	96
98	144	165	168	163	128	110	102	97
99	145	166	170	164	129	112	103	98
100	147	168	171	165	131	113	104	99
101	148	169	172	166	131	114	105	100
102	149	171	174	168	133	115	106	101
103	151	172	176	169	134	116	108	102
104	152	174	177	170	135	117	109	103
105	153	175	179	172	136	118	110	104
106	155	177	180	173	137	119	111	105
107	156	179	182	174	138	121	112	106
108	158	180	183	175	139	122	113	108
109	159	182	185	177	141	123	114	109
110	161	184	187	178	142	124	116	110
111	163	186	189	179	143	126	117	111
112	165	188	190	180	145	127	118	113
113	167	189	192	181	146	128	119	114
114	168	191	193	183	147	129	120	115
115	170	193	194	183	148	130	121	116
116	172	194	195	185	149	132	123	117
117	173	195	197	185	150	133	124	118
118	175	198	199	187	152	134	125	120
119	177	199	199	187	153	135	126	121
120	179	200	201	189	154	137	128	123
121	181	201	202	190	156	138	130	124
122	182	202	203	191	157	139	131	126
123	184	203	204	192	158	141	133	127
124	185	204	205	193	160	142	134	129
125	187	205	206	194	161	144	136	131
126	189	206	207	195	163	146	138	133
127	190	206	206	196	163	147	139	134
128	190	206	206	196	164	148	140	135
129	192	207	207	198	166	150	142	137
130	193	207	208	198	167	151	144	138
131	194	207	208	199	169	153	146	140
132	195	207	208	199	170	154	147	142
133	196	207	208	200	171	156	149	143
134	197	207	208	201	173	158	151	145
135	197	207	208	201	173	158	152	146
136	198	207	208	202	175	160	153	148
137	197	206	206	200	174	159	153	147
138	198	206	206	201	175	161	154	149
139	198	206	206	201	176	162	155	150
140	199	206	206	202	178	163	156	152

Time (min)	Conduit #2 Surface TC No. 228 (°F)	Conduit #2 Surface TC No. 229 (°F)	Conduit #2 Surface TC No. 230 (°F)	Conduit #2 Surface TC No. 231 (°F)	Conduit #2 Surface TC No. 232 (°F)	Conduit #2 Surface TC No. 233 (°F)	Conduit #2 Surface TC No. 234 (°F)	Conduit #2 Surface TC No. 235 (°F)
141	200	206	206	202	179	164	157	153
142	200	206	206	203	180	166	159	155
143	201	206	206	203	181	167	160	156
144	201	206	206	204	183	168	162	158
145	202	206	206	204	184	170	163	159
146	203	207	206	205	185	171	164	161
147	203	207	206	205	186	172	166	162
148	203	207	206	206	187	174	167	163
149	204	208	206	206	189	175	168	165
150	204	208	206	207	190	176	170	166
151	205	209	206	208	191	178	171	168
152	206	209	206	208	192	179	172	169
153	207	210	206	209	193	181	174	170
154	208	211	206	210	194	182	175	172
155	208	212	206	210	195	183	176	173
156	209	212	206	211	196	184	177	174
157	210	213	207	212	197	185	178	175
158	210	214	207	212	198	187	180	176
159	211	215	208	213	200	188	181	178
160	212	216	208	214	201	189	182	179
161	213	217	209	215	202	191	183	180
162	214	218	210	216	204	192	185	182
163	214	219	210	217	205	194	186	183
164	215	219	211	218	206	195	188	184
165	216	221	212	219	207	196	189	185
166	217	221	212	220	208	198	190	186
167	211	222	213	221	209	198	191	187
168	210	223	214	222	211	199	192	189
169	209	224	215	222	212	198	193	190
170	207	225	215	223	206	197	194	191
171	207	223	216	223	200	196	196	192
172	207	215	217	215	199	198	197	192
173	207	213	218	221	205	202	198	194
174	207	212	219	223	210	204	199	194
175	207	211	220	225	213	206	201	195
176	207	211	221	226	215	208	202	196
177	207	211	222	228	217	210	203	197
178	207	210	223	229	219	211	204	198
179	207	211	224	231	221	213	206	199
180	208	211	225	232	222	214	207	199

Time (min)	Conduit #2 Surface TC No. 236 (°F)	Conduit #2 Surface TC No. 237 (°F)	Conduit #2 Surface TC No. 238 (°F)	Conduit #2 Surface TC No. 239 (°F)	Conduit #2 Surface TC No. 240 (°F)	Conduit #2 Surface TC No. 241 (°F)	Conduit #2 Surface TC No. 242 (°F)	Conduit #2 Surface TC No. 243 (°F)
0	61	61	61	61	61	61	61	62
1	61	61	61	61	61	61	62	62
2	62	62	62	62	62	62	63	63
3	62	62	62	63	62	63	63	63
4	62	62	62	62	62	62	63	63
5	62	62	62	62	62	62	62	63
6	62	62	62	62	62	62	62	63
7	62	62	62	62	62	62	62	63
8	62	62	62	62	62	62	62	63
9	62	62	62	62	62	62	63	63
10	62	62	62	62	62	62	63	63
11	62	62	62	63	62	63	63	63
12	60	60	60	60	60	60	61	61
13	56	56	56	57	56	56	57	57
14	56	56	56	57	56	56	57	57
15	62	62	62	62	62	62	62	63
16	62	62	62	62	62	62	63	63
17	62	62	62	62	62	62	63	63
18	62	62	62	62	62	62	63	63
19	62	62	62	63	62	63	63	63
20	62	62	63	63	62	63	63	63
21	62	62	63	63	62	63	63	63
22	62	62	63	63	63	63	63	63
23	62	63	63	63	63	63	63	63
24	63	63	63	63	63	63	63	63
25	63	63	63	63	63	63	63	63
26	63	63	63	63	63	63	63	64
27	63	63	63	63	63	63	63	64
28	63	63	63	63	63	63	63	64
29	62	63	63	63	63	63	63	63
30	63	63	63	63	63	63	63	64
31	63	63	63	63	63	63	63	64
32	63	63	63	63	63	63	63	63
33	63	63	63	63	63	63	63	64
34	63	63	63	63	63	63	63	64
35	63	63	63	63	63	63	63	64
36	63	63	63	63	63	63	63	64
37	63	63	64	64	63	64	64	64
38	63	63	63	63	63	63	63	64
39	63	63	63	63	63	63	63	64
40	63	63	63	63	63	63	63	64
41	63	63	63	63	63	63	64	64
42	63	63	63	64	63	63	64	64
43	63	63	63	64	63	63	64	64
44	63	63	63	64	63	63	64	64
45	63	63	64	64	63	64	64	65
46	64	64	64	64	64	64	64	65

OMEGA POINT LABORATORIES

Time (min)	Conduit #2 Surface TC No. 236 (°F)	Conduit #2 Surface TC No. 237 (°F)	Conduit #2 Surface TC No. 238 (°F)	Conduit #2 Surface TC No. 239 (°F)	Conduit #2 Surface TC No. 240 (°F)	Conduit #2 Surface TC No. 241 (°F)	Conduit #2 Surface TC No. 242 (°F)	Conduit #2 Surface TC No. 243 (°F)
47	64	64	64	64	64	64	64	65
48	64	64	64	64	64	64	65	65
49	64	64	64	65	64	65	65	65
50	64	64	65	65	65	65	65	65
51	65	65	65	65	65	65	65	66
52	65	65	65	65	65	65	65	66
53	65	65	65	65	65	65	66	66
54	66	65	66	66	65	66	66	66
55	66	66	66	66	66	66	66	67
56	66	66	66	66	66	66	66	67
57	67	66	67	67	66	67	67	67
58	67	67	67	67	67	67	67	68
59	68	67	67	67	67	67	68	68
60	68	68	68	68	68	68	68	68
61	68	68	68	68	68	68	68	69
62	69	68	68	68	68	68	69	69
63	69	69	69	69	69	69	69	70
64	70	69	69	69	69	70	70	70
65	70	70	69	70	70	70	70	71
66	71	70	70	70	70	70	71	72
67	71	71	71	71	71	71	71	72
68	72	71	71	71	71	72	72	73
69	73	72	72	72	72	72	72	73
70	73	73	72	73	72	73	73	74
71	74	73	73	73	73	74	74	75
72	75	74	74	74	74	74	74	75
73	75	75	74	75	74	75	75	76
74	76	75	75	75	75	76	76	77
75	77	76	76	76	76	76	77	78
76	77	77	77	77	77	77	77	78
77	78	78	77	77	77	78	78	79
78	79	78	78	78	78	79	79	80
79	80	79	79	79	79	79	80	81
80	80	80	80	80	80	80	81	82
81	81	81	80	81	81	81	81	83
82	82	82	81	82	81	82	82	83
83	83	83	82	83	82	83	83	84
84	84	83	83	83	83	84	84	85
85	84	84	84	84	84	84	85	86
86	85	85	85	85	85	85	86	87
87	86	86	86	86	86	86	86	87
88	87	87	86	87	86	87	87	88
89	88	87	87	88	87	88	88	89
90	89	89	88	89	88	89	89	90
91	90	89	89	90	89	90	90	91
92	90	90	90	90	90	91	91	92
93	91	91	91	91	91	92	92	92

Time (min)	Conduit #2 Surface TC No. 236 (°F)	Conduit #2 Surface TC No. 237 (°F)	Conduit #2 Surface TC No. 238 (°F)	Conduit #2 Surface TC No. 239 (°F)	Conduit #2 Surface TC No. 240 (°F)	Conduit #2 Surface TC No. 241 (°F)	Conduit #2 Surface TC No. 242 (°F)	Conduit #2 Surface TC No. 243 (°F)
94	92	92	92	92	92	93	93	93
95	93	93	93	93	93	94	94	94
96	94	94	94	94	94	95	95	95
97	95	95	95	95	95	95	96	96
98	96	96	96	96	96	97	97	97
99	97	97	97	97	97	98	98	98
100	98	98	98	98	98	99	99	99
101	99	99	99	99	99	99	100	100
102	100	100	100	100	100	101	101	101
103	101	101	101	102	101	102	102	102
104	102	102	102	103	102	103	103	103
105	103	103	103	104	104	104	104	104
106	104	104	104	105	104	105	105	105
107	106	105	106	106	106	106	106	106
108	107	106	107	107	107	107	107	107
109	108	108	108	109	108	108	108	109
110	109	109	109	110	109	110	109	110
111	111	110	111	111	111	111	111	111
112	112	112	112	113	112	112	112	112
113	113	113	113	114	113	113	113	113
114	114	114	114	115	114	115	114	114
115	115	115	115	116	115	115	115	115
116	117	117	117	117	117	117	116	116
117	118	118	118	118	118	118	117	117
118	120	119	120	120	119	119	119	119
119	121	120	120	121	120	120	119	119
120	122	122	122	122	122	122	121	121
121	124	123	123	124	123	123	122	122
122	125	124	124	125	124	124	123	123
123	127	126	126	126	126	126	125	125
124	128	128	128	128	128	127	126	126
125	130	130	130	130	129	129	128	128
126	132	131	131	131	131	130	130	130
127	132	132	132	132	131	131	130	130
128	134	133	133	133	133	132	131	131
129	136	136	136	136	135	135	134	134
130	137	137	137	137	136	136	135	135
131	138	138	139	139	138	137	137	136
132	140	140	140	140	139	139	138	138
133	141	141	142	141	141	140	139	139
134	143	143	143	143	143	142	141	141
135	144	144	145	145	144	143	142	142
136	145	145	146	146	145	144	143	143
137	145	145	146	146	145	144	143	143
138	147	147	148	147	147	146	145	144
139	148	148	149	149	148	147	146	146
140	150	150	151	151	150	149	148	147

OMEGA POINT LABORATORIES

Time (min)	Conduit #2 Surface TC No. 236 (°F)	Conduit #2 Surface TC No. 237 (°F)	Conduit #2 Surface TC No. 238 (°F)	Conduit #2 Surface TC No. 239 (°F)	Conduit #2 Surface TC No. 240 (°F)	Conduit #2 Surface TC No. 241 (°F)	Conduit #2 Surface TC No. 242 (°F)	Conduit #2 Surface TC No. 243 (°F)
141	152	151	152	153	152	151	149	149
142	153	153	154	155	154	152	151	151
143	155	155	156	156	155	154	153	152
144	156	156	157	158	157	155	154	153
145	158	158	159	159	158	157	155	155
146	160	159	160	160	160	158	157	156
147	161	161	161	162	161	160	158	157
148	163	162	163	163	163	161	159	158
149	164	164	164	165	164	163	160	158
150	165	165	165	166	165	164	162	159
151	167	166	167	167	167	165	163	160
152	168	168	168	168	168	166	164	161
153	169	169	169	169	169	168	165	162
154	170	170	170	171	170	169	166	163
155	172	171	171	172	171	170	167	164
156	173	172	172	173	172	171	168	165
157	174	173	173	174	173	172	170	166
158	175	174	174	175	174	174	171	167
159	176	176	175	176	175	175	172	169
160	177	177	176	177	176	176	173	170
161	179	178	178	178	177	177	174	171
162	180	179	179	179	178	179	176	172
163	181	180	180	180	179	180	177	173
164	182	181	181	181	180	181	178	174
165	183	182	182	182	181	182	179	175
166	185	183	183	183	182	184	181	176
167	185	184	184	184	183	185	182	178
168	186	185	185	185	185	186	183	179
169	188	186	186	186	186	187	184	180
170	188	187	187	187	187	188	185	180
171	190	188	188	188	188	189	186	181
172	190	189	188	188	189	190	187	182
173	192	190	189	189	190	191	188	182
174	192	191	190	190	191	192	189	183
175	193	191	191	191	192	193	190	184
176	194	192	192	192	192	194	191	185
177	195	193	193	193	193	195	191	186
178	196	194	194	194	194	196	192	186
179	197	194	194	195	195	197	193	187
180	197	195	195	195	196	198	194	188

Time (min)	Conduit #2 Surface TC No. 244 (°F)	Conduit #2 Surface TC No. 245 (°F)	Conduit #4 Surface TC No. 246 (°F)	Conduit #4 Surface TC No. 247 (°F)	Conduit #4 Surface TC No. 248 (°F)	Conduit #4 Surface TC No. 249 (°F)	Conduit #4 Surface TC No. 250 (°F)	Conduit #4 Surface TC No. 251 (°F)
0	62	63	62	62	62	62	62	61
1	62	63	62	62	62	62	62	61
2	63	64	63	63	63	63	63	62
3	64	64	63	63	63	63	63	62
4	63	64	63	63	63	63	63	62
5	63	64	63	63	63	63	63	62
6	63	64	63	63	63	63	63	62
7	63	64	63	63	63	63	63	62
8	63	64	63	63	63	63	63	62
9	63	64	63	63	63	63	63	62
10	63	64	63	63	63	63	63	62
11	64	64	63	63	63	63	63	62
12	61	62	62	61	61	61	61	60
13	57	58	59	59	58	58	58	57
14	58	58	59	59	58	58	58	58
15	63	64	64	63	63	63	63	62
16	63	64	64	63	63	63	63	62
17	63	64	65	63	63	63	63	62
18	63	64	65	63	63	63	63	62
19	64	64	66	64	63	63	63	63
20	64	64	67	64	63	63	64	63
21	64	65	67	64	64	63	64	63
22	64	65	68	65	64	64	64	63
23	64	65	69	65	64	64	64	64
24	64	65	70	65	64	64	65	64
25	64	65	70	65	64	64	65	64
26	64	66	71	66	65	64	65	64
27	64	66	72	66	65	65	65	65
28	64	66	73	67	65	65	65	65
29	64	66	73	67	65	65	66	65
30	64	66	74	67	66	65	66	65
31	64	66	75	68	66	66	66	66
32	64	66	76	68	66	66	66	66
33	64	67	77	69	67	66	67	67
34	64	67	77	69	67	66	67	67
35	64	67	78	70	67	67	68	67
36	65	67	79	70	68	67	68	68
37	65	68	81	72	69	68	69	69
38	65	68	81	72	69	68	69	69
39	65	68	83	72	69	69	69	69
40	65	68	84	73	70	69	70	70
41	65	68	85	74	70	70	71	70
42	65	69	86	74	71	70	71	71
43	65	69	88	75	72	71	72	71
44	66	69	89	76	72	72	72	72
45	66	69	90	77	73	72	73	73
46	66	70	92	78	74	73	74	73

Time (min)	Conduit #2 Surface TC No. 244 (°F)	Conduit #2 Surface TC No. 245 (°F)	Conduit #4 Surface TC No. 246 (°F)	Conduit #4 Surface TC No. 247 (°F)	Conduit #4 Surface TC No. 248 (°F)	Conduit #4 Surface TC No. 249 (°F)	Conduit #4 Surface TC No. 250 (°F)	Conduit #4 Surface TC No. 251 (°F)
47	66	70	93	79	74	74	74	74
48	66	71	94	80	75	74	75	74
49	67	71	95	81	76	75	76	75
50	67	72	97	82	77	76	76	76
51	67	73	98	83	78	77	77	77
52	68	74	100	84	78	77	78	77
53	68	74	101	85	79	78	79	78
54	68	75	103	87	80	79	79	79
55	69	75	104	88	81	80	80	80
56	69	76	105	89	82	81	81	80
57	70	77	107	90	83	81	82	81
58	70	77	108	91	84	82	82	82
59	71	78	110	92	85	83	83	83
60	71	78	111	94	86	84	84	83
61	72	78	113	95	87	84	85	84
62	72	79	114	96	88	85	86	85
63	73	79	116	97	88	86	87	86
64	73	80	118	99	90	87	87	87
65	74	80	120	100	90	88	88	87
66	75	81	122	102	92	89	89	88
67	75	81	125	103	93	90	90	89
68	76	82	128	105	94	91	91	90
69	77	82	130	107	95	92	92	91
70	77	83	133	109	96	93	92	92
71	78	84	136	111	97	94	93	93
72	79	84	139	114	98	95	95	94
73	79	85	142	117	99	96	96	95
74	80	86	145	120	101	97	97	96
75	81	86	147	123	102	98	98	97
76	81	87	149	127	103	99	99	98
77	82	88	152	131	105	100	99	99
78	83	88	154	135	107	101	101	100
79	84	89	156	139	109	102	102	101
80	85	90	157	143	113	104	103	102
81	85	91	159	147	116	105	104	103
82	86	91	160	151	119	107	105	104
83	87	92	161	154	123	108	107	105
84	88	93	162	156	128	110	108	106
85	88	94	163	159	132	112	109	108
86	89	94	164	161	137	114	111	109
87	90	95	165	162	141	116	111	110
88	91	96	166	164	145	119	113	111
89	92	96	166	165	149	122	115	112
90	93	98	167	167	153	126	117	114
91	93	98	168	167	156	129	118	115
92	94	99	168	168	158	134	120	117
93	95	100	169	169	161	138	122	118

Time (min)	Conduit #2 Surface TC No. 244 (°F)	Conduit #2 Surface TC No. 245 (°F)	Conduit #4 Surface TC No. 246 (°F)	Conduit #4 Surface TC No. 247 (°F)	Conduit #4 Surface TC No. 248 (°F)	Conduit #4 Surface TC No. 249 (°F)	Conduit #4 Surface TC No. 250 (°F)	Conduit #4 Surface TC No. 251 (°F)
94	95	100	169	169	162	143	124	120
95	96	101	170	170	164	148	127	121
96	97	102	171	171	165	152	130	123
97	98	103	171	171	167	155	134	125
98	99	104	171	171	167	158	138	127
99	100	105	172	172	168	161	142	130
100	101	105	172	173	169	163	146	132
101	102	106	173	173	169	165	150	135
102	103	107	173	173	170	167	154	138
103	104	108	173	173	171	168	158	142
104	105	109	174	174	171	169	161	145
105	105	110	174	174	171	170	163	149
106	106	111	175	174	172	171	165	152
107	107	111	175	175	172	171	167	155
108	108	112	176	175	173	172	168	158
109	109	114	176	176	173	173	170	161
110	110	114	177	176	174	173	171	164
111	111	116	177	177	174	174	172	166
112	113	117	178	178	175	175	173	168
113	114	118	178	178	176	175	174	169
114	115	119	179	179	176	176	175	171
115	116	120	180	179	177	176	176	172
116	117	122	180	180	177	177	176	173
117	118	123	181	180	178	177	177	174
118	119	124	182	181	179	178	178	175
119	120	125	182	182	179	179	179	176
120	122	127	182	182	180	180	179	177
121	123	128	183	183	181	180	180	178
122	123	130	184	184	181	181	180	179
123	125	132	184	184	182	182	182	180
124	127	135	185	185	183	183	182	181
125	128	137	186	186	184	184	183	182
126	130	140	187	186	184	185	185	184
127	131	141	186	186	185	185	185	184
128	132	142	187	187	185	185	185	185
129	134	145	188	188	186	187	187	186
130	135	147	188	188	187	187	187	187
131	137	148	189	189	187	188	188	188
132	138	150	190	190	188	188	189	188
133	140	151	190	191	189	189	190	189
134	142	153	191	191	189	190	191	190
135	143	154	191	191	190	190	191	191
136	144	155	191	191	190	191	191	191
137	144	154	190	191	189	190	191	190
138	146	156	191	191	190	191	191	191
139	147	157	191	192	191	191	192	191
140	149	158	190	192	191	192	193	192

Time (min)	Conduit #2 Surface TC No. 244 (°F)	Conduit #2 Surface TC No. 245 (°F)	Conduit #4 Surface TC No. 246 (°F)	Conduit #4 Surface TC No. 247 (°F)	Conduit #4 Surface TC No. 248 (°F)	Conduit #4 Surface TC No. 249 (°F)	Conduit #4 Surface TC No. 250 (°F)	Conduit #4 Surface TC No. 251 (°F)
141	151	157	190	192	191	192	193	192
142	152	158	190	193	192	193	194	193
143	154	159	190	193	192	193	194	194
144	155	159	191	194	193	194	195	194
145	156	160	191	194	194	195	195	195
146	157	160	192	194	194	195	196	195
147	157	161	193	195	194	196	196	196
148	158	161	192	195	195	196	197	196
149	158	162	193	195	195	196	197	196
150	159	163	194	195	195	196	197	196
151	160	163	195	195	195	196	197	197
152	161	163	195	195	195	196	197	197
153	162	164	194	195	196	196	197	197
154	162	165	195	195	195	197	198	197
155	163	165	193	195	195	197	198	197
156	164	165	193	195	195	197	198	197
157	165	166	193	195	196	197	198	198
158	166	166	193	195	196	198	199	197
159	167	167	194	195	196	198	199	198
160	168	168	194	196	196	198	199	198
161	169	168	194	195	196	198	200	199
162	171	170	194	196	196	199	200	199
163	172	170	194	196	197	199	201	199
164	172	170	193	196	197	199	201	200
165	173	171	193	196	197	200	201	200
166	174	172	194	196	197	200	202	201
167	175	173	194	196	198	200	203	201
168	176	174	195	197	198	201	203	201
169	177	174	195	197	198	201	203	201
170	178	175	195	197	198	201	204	202
171	179	176	196	198	198	202	204	202
172	179	176	196	198	198	202	205	203
173	180	177	197	198	198	202	205	204
174	181	177	197	198	199	203	205	204
175	182	178	197	198	199	203	205	204
176	183	178	198	199	200	203	205	205
177	183	179	198	199	200	204	206	205
178	184	180	198	199	200	204	207	205
179	185	181	198	200	200	205	207	206
180	185	182	199	200	200	205	208	206

Time (min)	Conduit #4 Surface TC No. 252 (°F)	Conduit #4 Surface TC No. 253 (°F)	Conduit #4 Surface TC No. 254 (°F)	Conduit #4 Surface TC No. 255 (°F)	Conduit #4 Surface TC No. 256 (°F)	Conduit #4 Surface TC No. 257 (°F)	Conduit #4 Surface TC No. 258 (°F)	Conduit #4 Surface TC No. 259 (°F)
0	62	62	62	61	61	62	61	61
1	62	62	62	61	61	62	61	61
2	63	62	63	62	63	63	62	62
3	63	62	63	62	63	63	62	63
4	63	62	63	62	63	63	62	62
5	63	62	63	62	62	63	62	62
6	63	62	63	62	62	63	62	62
7	63	62	63	62	62	63	62	62
8	63	62	63	62	62	63	62	62
9	63	62	63	63	62	63	62	62
10	63	62	64	70	63	63	62	62
11	63	63	66	75	63	63	62	62
12	62	61	67	78	61	61	60	61
13	58	58	65	77	57	57	56	56
14	58	58	67	81	57	57	56	57
15	63	63	73	88	62	63	62	62
16	63	63	75	91	63	63	62	62
17	63	64	77	94	63	63	62	62
18	63	64	79	97	63	63	62	62
19	64	65	81	100	63	63	62	62
20	64	65	83	103	63	63	62	62
21	64	66	85	106	63	63	62	62
22	64	66	87	108	63	63	62	63
23	65	67	89	111	63	63	62	63
24	65	68	91	113	63	64	63	63
25	65	69	93	115	64	64	63	63
26	66	70	95	117	64	64	63	63
27	66	71	96	119	64	64	63	63
28	67	71	98	120	64	64	63	63
29	67	72	99	121	64	64	63	63
30	68	73	100	122	64	64	63	63
31	68	74	101	123	64	65	63	63
32	69	75	102	123	64	65	63	63
33	69	76	102	122	65	65	63	63
34	70	76	103	122	65	65	63	63
35	70	77	103	120	65	65	63	63
36	71	78	103	119	66	66	63	63
37	72	79	103	117	66	66	64	63
38	72	79	102	115	66	66	63	63
39	73	80	102	114	66	67	63	63
40	73	80	101	112	67	67	63	63
41	74	81	101	112	67	67	64	63
42	75	82	101	111	68	68	64	63
43	75	82	101	111	69	69	64	63
44	76	83	101	111	70	70	64	63
45	76	83	101	111	71	71	64	63
46	77	84	101	111	73	73	65	64

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Surface TC No. 252 (°F)	Conduit #4 Surface TC No. 253 (°F)	Conduit #4 Surface TC No. 254 (°F)	Conduit #4 Surface TC No. 255 (°F)	Conduit #4 Surface TC No. 256 (°F)	Conduit #4 Surface TC No. 257 (°F)	Conduit #4 Surface TC No. 258 (°F)	Conduit #4 Surface TC No. 259 (°F)
47	78	84	101	111	75	75	65	64
48	78	84	101	112	77	77	65	64
49	79	85	101	112	80	79	66	64
50	80	85	102	112	83	82	67	64
51	80	86	102	113	85	84	67	65
52	81	86	102	113	88	87	68	65
53	81	87	102	114	90	89	69	65
54	82	87	103	114	93	92	70	66
55	83	88	103	115	96	94	71	66
56	83	88	103	116	98	96	72	67
57	84	89	104	116	101	99	73	67
58	85	89	105	117	104	101	73	68
59	86	90	105	118	107	104	75	68
60	86	90	106	119	109	106	76	69
61	87	91	106	120	112	109	77	69
62	88	91	107	121	115	112	78	70
63	88	92	108	122	118	114	79	71
64	89	93	108	122	120	117	81	71
65	90	93	109	123	123	119	82	72
66	90	94	109	125	125	121	83	73
67	91	94	110	126	127	123	84	74
68	92	95	111	127	129	125	86	75
69	93	96	112	129	131	126	87	75
70	94	97	112	130	133	128	88	76
71	95	97	113	131	135	130	90	77
72	96	98	114	132	137	131	91	78
73	96	99	115	133	138	132	92	79
74	97	100	116	134	140	134	94	80
75	98	101	116	135	141	135	95	81
76	99	102	117	136	142	136	96	82
77	100	102	118	137	144	138	97	83
78	101	103	119	138	145	139	99	84
79	102	104	119	139	146	140	100	85
80	103	105	120	140	148	142	101	86
81	104	106	121	142	149	143	102	87
82	105	107	122	143	151	144	103	88
83	107	108	123	144	152	145	105	89
84	107	109	124	145	153	146	106	90
85	109	110	125	145	154	147	107	91
86	110	111	125	146	155	148	108	92
87	111	112	126	147	156	149	109	93
88	112	113	127	148	157	150	110	94
89	113	114	124	149	158	151	111	95
90	115	115	128	150	160	152	112	96
91	116	116	129	151	161	153	113	97
92	117	118	130	152	162	154	114	98
93	118	119	131	153	163	155	115	99

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Surface TC No. 252 (°F)	Conduit #4 Surface TC No. 253 (°F)	Conduit #4 Surface TC No. 254 (°F)	Conduit #4 Surface TC No. 255 (°F)	Conduit #4 Surface TC No. 256 (°F)	Conduit #4 Surface TC No. 257 (°F)	Conduit #4 Surface TC No. 258 (°F)	Conduit #4 Surface TC No. 259 (°F)
94	120	120	132	154	164	156	116	100
95	121	122	133	155	165	158	117	101
96	123	123	134	156	166	159	118	102
97	124	124	135	157	167	160	119	103
98	126	126	136	158	169	161	121	104
99	128	127	137	159	170	163	122	105
100	130	129	138	161	171	164	123	106
101	132	130	139	162	173	165	124	107
102	134	132	141	163	174	166	125	108
103	136	134	142	164	176	167	126	109
104	139	136	143	165	177	168	127	111
105	142	138	144	167	178	169	128	111
106	144	140	146	168	179	170	129	113
107	147	142	147	169	181	172	131	114
108	149	144	149	170	182	173	131	115
109	152	147	151	172	184	174	133	116
110	155	149	153	173	185	175	134	117
111	158	152	154	175	187	176	135	118
112	160	154	156	177	188	178	137	120
113	163	156	158	178	189	178	138	121
114	165	159	160	180	190	179	139	122
115	167	161	162	181	191	180	140	123
116	168	163	164	183	192	181	141	124
117	170	166	166	185	193	181	142	125
118	172	168	169	187	195	182	144	127
119	174	170	171	188	195	182	144	128
120	175	173	173	190	197	183	146	130
121	177	175	175	191	198	184	147	131
122	178	176	176	193	199	185	148	133
123	179	178	178	194	200	186	149	134
124	181	179	180	195	201	187	151	136
125	182	181	182	197	203	188	153	138
126	183	183	184	198	203	189	154	139
127	184	183	184	198	203	189	154	140
128	185	184	185	199	204	190	156	142
129	186	186	187	200	205	191	157	144
130	187	187	188	201	205	192	159	145
131	188	188	189	201	206	193	160	147
132	188	188	190	202	206	194	161	148
133	189	189	191	202	206	194	163	150
134	190	190	191	203	206	195	164	151
135	191	191	192	203	206	195	165	152
136	191	191	191	203	206	196	166	153
137	191	190	190	201	204	194	165	153
138	191	191	191	202	204	195	166	154
139	192	192	192	202	204	195	168	155
140	192	192	193	202	205	196	169	156

Time (min)	Conduit #4 Surface TC No. 252 (°F)	Conduit #4 Surface TC No. 253 (°F)	Conduit #4 Surface TC No. 254 (°F)	Conduit #4 Surface TC No. 255 (°F)	Conduit #4 Surface TC No. 256 (°F)	Conduit #4 Surface TC No. 257 (°F)	Conduit #4 Surface TC No. 258 (°F)	Conduit #4 Surface TC No. 259 (°F)
141	193	193	193	202	205	196	170	158
142	194	193	193	203	205	196	171	159
143	194	194	194	203	205	197	172	160
144	195	194	195	203	205	197	173	161
145	195	195	196	203	205	198	174	162
146	196	195	196	203	205	198	175	163
147	196	196	196	203	205	198	176	165
148	196	196	197	203	205	199	177	166
149	197	196	197	203	205	199	178	167
150	197	197	198	203	205	199	179	168
151	197	197	197	204	205	200	180	170
152	197	197	198	204	205	200	181	171
153	197	197	198	204	205	200	182	172
154	198	197	198	204	205	200	183	173
155	198	197	199	204	205	201	183	174
156	198	197	198	204	205	201	184	175
157	198	197	199	204	205	201	185	176
158	198	197	198	204	205	201	186	177
159	198	197	198	204	205	202	187	178
160	198	197	199	204	205	202	188	179
161	198	197	198	204	205	202	189	180
162	198	198	199	205	206	203	190	182
163	198	198	199	205	206	203	191	183
164	199	198	199	205	206	204	192	184
165	199	198	200	205	206	204	193	185
166	199	199	200	205	206	204	194	186
167	199	199	200	205	206	205	194	187
168	200	199	200	205	206	205	195	187
169	200	199	200	205	206	205	194	188
170	200	199	201	205	206	205	194	189
171	200	200	201	205	206	203	194	190
172	201	200	201	205	206	203	195	190
173	201	200	202	205	205	203	196	191
174	201	201	202	205	205	203	196	192
175	202	201	202	205	205	203	197	193
176	202	201	202	205	205	203	197	194
177	202	201	202	205	206	203	198	194
178	202	202	203	205	206	204	198	195
179	202	202	203	205	206	204	199	196
180	203	202	203	205	206	204	199	196

Time (min)	Conduit #4 Surface TC No. 260 (°F)	Conduit #4 Surface TC No. 261 (°F)	Conduit #4 Surface TC No. 262 (°F)	Conduit #4 Surface TC No. 263 (°F)	Conduit #4 Surface TC No. 264 (°F)	Conduit #4 Surface TC No. 265 (°F)	Conduit #4 Surface TC No. 266 (°F)	Conduit #4 Surface TC No. 267 (°F)
0	62	61	61	61	62	61	61	62
1	62	61	61	61	62	61	61	62
2	63	62	62	62	63	62	62	63
3	63	62	62	62	63	63	63	63
4	63	62	62	62	63	62	62	63
5	63	62	62	62	63	62	62	63
6	63	62	62	62	63	62	62	63
7	63	62	62	62	63	62	62	63
8	63	62	62	62	63	62	62	63
9	63	62	62	62	63	62	62	63
10	63	62	62	62	63	62	62	63
11	63	62	62	62	63	62	62	63
12	61	61	60	61	61	61	61	62
13	57	57	56	57	57	57	57	58
14	57	57	56	57	57	57	57	58
15	63	62	62	62	63	62	62	63
16	63	62	62	62	63	62	62	63
17	63	62	62	62	63	62	62	63
18	63	62	62	62	63	62	62	63
19	63	62	62	62	63	62	62	63
20	63	62	62	62	63	62	62	63
21	63	62	62	62	63	63	62	63
22	63	62	62	62	63	63	62	64
23	63	62	62	62	63	63	63	64
24	63	62	62	62	63	63	63	64
25	63	62	62	62	63	63	63	64
26	63	62	62	62	63	63	63	64
27	63	62	62	62	63	63	63	64
28	63	62	62	62	63	63	63	64
29	63	62	62	62	63	63	62	64
30	63	62	62	62	63	63	63	64
31	63	63	62	62	63	63	63	64
32	63	62	62	62	63	63	63	64
33	63	62	62	62	63	63	63	64
34	63	62	62	62	63	63	63	64
35	63	62	62	62	63	63	63	64
36	63	62	62	62	63	63	63	64
37	64	63	63	63	64	63	63	64
38	63	63	62	62	63	63	63	64
39	63	62	62	62	63	63	63	64
40	63	62	62	62	63	63	63	64
41	63	63	62	62	63	63	63	64
42	64	63	62	62	63	63	63	64
43	64	63	62	63	63	63	63	64
44	64	63	62	63	63	63	63	64
45	64	63	62	63	63	63	63	64
46	64	63	63	63	64	63	63	64

Time (min)	Conduit #4 Surface TC No. 260 (°F)	Conduit #4 Surface TC No. 261 (°F)	Conduit #4 Surface TC No. 262 (°F)	Conduit #4 Surface TC No. 263 (°F)	Conduit #4 Surface TC No. 264 (°F)	Conduit #4 Surface TC No. 265 (°F)	Conduit #4 Surface TC No. 266 (°F)	Conduit #4 Surface TC No. 267 (°F)
47	64	63	63	63	64	63	63	64
48	64	63	63	63	64	63	63	64
49	65	63	63	63	64	64	64	65
50	65	64	63	63	64	64	64	65
51	65	64	63	64	64	64	64	65
52	65	64	64	64	64	64	64	65
53	65	64	64	64	65	64	64	65
54	66	64	64	64	65	64	64	65
55	66	65	64	64	65	65	65	66
56	66	65	64	65	65	65	65	66
57	67	65	65	65	66	65	65	66
58	67	66	65	65	66	66	66	67
59	67	66	65	66	66	66	66	67
60	68	66	66	66	67	66	66	67
61	68	66	66	66	67	67	66	68
62	69	67	66	67	67	67	67	68
63	69	68	67	67	68	67	67	69
64	70	68	67	68	68	68	68	69
65	70	68	68	68	69	68	68	70
66	71	69	68	68	69	69	69	70
67	72	70	69	69	70	70	70	71
68	72	70	69	70	70	70	70	71
69	73	71	70	70	71	71	71	72
70	74	71	70	71	71	71	71	73
71	74	72	71	71	72	72	72	73
72	76	73	72	72	73	73	73	74
73	76	73	72	72	73	73	73	75
74	77	74	73	73	74	74	74	76
75	78	75	73	74	75	75	75	76
76	79	75	74	75	75	75	75	77
77	79	76	75	75	76	76	76	78
78	80	77	76	76	77	77	77	79
79	81	78	76	77	78	78	78	79
80	82	79	77	78	79	79	79	80
81	83	79	78	79	79	79	79	81
82	84	80	79	79	80	80	80	82
83	85	81	80	80	81	81	81	83
84	85	82	80	81	82	82	82	84
85	87	83	81	82	82	83	83	85
86	87	84	82	82	83	83	84	85
87	88	84	83	83	84	84	85	86
88	89	85	84	84	85	85	85	87
89	90	86	85	85	86	86	86	88
90	91	87	86	86	87	87	87	89
91	92	88	87	87	88	88	88	90
92	93	89	87	88	88	89	89	91
93	94	90	88	89	89	90	90	91

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Surface TC No. 260 (°F)	Conduit #4 Surface TC No. 261 (°F)	Conduit #4 Surface TC No. 262 (°F)	Conduit #4 Surface TC No. 263 (°F)	Conduit #4 Surface TC No. 264 (°F)	Conduit #4 Surface TC No. 265 (°F)	Conduit #4 Surface TC No. 266 (°F)	Conduit #4 Surface TC No. 267 (°F)
94	94	91	89	89	90	90	91	92
95	96	92	90	91	91	92	92	93
96	97	93	91	91	92	93	93	94
97	98	94	92	92	93	93	93	95
98	99	95	93	93	94	94	95	96
99	100	96	94	95	95	96	96	97
100	101	97	95	95	96	97	97	98
101	101	98	96	96	97	98	98	99
102	103	99	97	98	99	99	99	100
103	104	100	98	99	99	100	100	101
104	105	101	99	100	101	101	101	102
105	106	102	100	101	102	102	102	103
106	107	103	101	102	103	103	103	104
107	108	104	103	103	104	104	104	105
108	109	105	104	104	105	105	105	106
109	110	107	105	106	106	107	106	108
110	112	108	106	107	108	108	108	109
111	113	109	108	108	109	109	109	110
112	114	111	109	109	110	110	110	111
113	115	112	110	111	111	111	111	112
114	117	113	111	112	113	113	113	114
115	118	114	113	113	114	114	113	114
116	119	116	114	114	115	115	115	116
117	120	117	115	115	116	116	116	117
118	122	118	117	117	117	117	117	118
119	123	119	118	118	118	118	118	119
120	125	121	119	119	120	120	119	120
121	126	122	120	121	121	121	120	121
122	127	124	122	122	122	122	122	122
123	129	125	123	123	124	124	123	124
124	131	127	125	125	125	125	124	125
125	133	129	127	127	127	127	126	127
126	134	130	128	128	128	128	127	128
127	135	131	129	129	129	129	128	129
128	136	132	130	130	131	130	129	130
129	139	134	133	132	133	132	131	132
130	140	136	134	134	134	134	133	134
131	142	138	136	136	136	135	135	135
132	143	139	137	137	137	137	136	136
133	144	140	139	139	139	138	138	138
134	146	142	140	140	140	140	139	140
135	147	143	142	142	142	141	140	141
136	148	145	143	143	143	143	142	143
137	148	144	143	143	143	143	142	142
138	149	146	145	144	145	144	143	144
139	151	147	146	146	147	146	145	146
140	152	149	148	148	148	148	147	147

Time (min)	Conduit #4 Surface TC No. 260 (°F)	Conduit #4 Surface TC No. 261 (°F)	Conduit #4 Surface TC No. 262 (°F)	Conduit #4 Surface TC No. 263 (°F)	Conduit #4 Surface TC No. 264 (°F)	Conduit #4 Surface TC No. 265 (°F)	Conduit #4 Surface TC No. 266 (°F)	Conduit #4 Surface TC No. 267 (°F)
141	154	150	149	149	150	149	148	149
142	155	152	151	151	151	151	150	150
143	157	154	152	152	153	152	151	152
144	158	155	154	154	154	154	153	154
145	159	156	156	155	156	155	154	155
146	161	158	157	157	158	157	156	157
147	162	159	158	158	159	158	157	158
148	164	161	160	160	160	160	159	159
149	165	162	161	161	162	161	160	160
150	166	163	163	162	163	162	162	161
151	168	165	164	164	164	163	163	163
152	169	166	165	165	166	165	164	164
153	170	167	166	166	167	166	165	165
154	171	168	167	167	168	167	166	166
155	172	169	168	168	169	168	167	168
156	173	170	169	169	170	169	168	169
157	174	171	170	170	171	170	170	170
158	175	172	171	171	172	171	171	171
159	177	174	172	172	173	172	172	172
160	178	175	174	174	175	174	173	173
161	179	176	175	175	176	175	175	175
162	180	177	176	176	177	176	176	176
163	181	178	177	177	178	177	177	177
164	182	179	178	178	179	178	178	178
165	183	180	179	179	180	179	179	180
166	184	181	180	179	181	180	180	180
167	185	182	180	180	182	181	181	181
168	186	183	181	181	183	182	182	182
169	187	184	182	182	183	183	182	183
170	188	185	183	183	184	184	184	184
171	188	185	184	184	185	185	185	185
172	189	186	185	184	186	185	186	187
173	190	187	185	185	186	186	187	187
174	191	188	186	186	187	187	187	188
175	192	189	187	187	188	188	188	189
176	192	190	188	188	189	189	189	190
177	193	190	188	188	190	190	190	190
178	194	191	189	189	190	190	190	191
179	195	192	190	190	191	191	191	191
180	195	192	191	190	191	191	192	192

Time (min)	Conduit #4 Surface TC No. 268 (°F)	Conduit #4 Surface TC No. 269 (°F)	Conduit #4 Surface TC No. 270 (°F)	Conduit #4 Surface TC No. 271 (°F)	Conduit #6 Surface TC No. 272 (°F)	Conduit #6 Surface TC No. 273 (°F)	Conduit #6 Surface TC No. 274 (°F)	Conduit #6 Surface TC No. 275 (°F)
0	64	64	65	64	63	62	62	62
1	64	64	65	64	63	62	62	62
2	65	65	66	64	64	63	63	62
3	65	65	66	65	64	63	63	63
4	65	65	66	65	64	63	63	62
5	65	65	66	64	64	63	63	62
6	65	65	66	64	64	63	62	62
7	65	65	66	64	64	63	63	62
8	65	65	66	64	64	63	62	62
9	65	65	66	65	64	63	63	63
10	65	65	66	65	64	63	63	63
11	65	65	66	65	64	63	63	63
12	64	63	64	63	62	62	61	61
13	60	60	61	60	59	59	58	58
14	60	60	61	60	60	59	58	58
15	65	65	66	64	65	63	62	62
16	65	65	66	65	66	63	63	63
17	65	65	66	65	66	63	63	63
18	65	65	66	65	67	63	63	63
19	65	65	66	65	68	64	63	63
20	65	65	66	65	69	64	63	63
21	65	65	66	65	70	64	63	63
22	65	65	66	65	71	65	63	63
23	65	65	66	65	72	65	63	63
24	65	65	66	65	73	65	63	63
25	65	65	66	65	74	66	64	63
26	66	65	66	65	75	66	64	63
27	66	65	66	65	76	66	64	64
28	65	65	66	65	77	67	64	64
29	65	65	66	65	78	67	64	64
30	66	65	66	65	79	68	65	64
31	66	65	66	65	80	68	65	65
32	65	65	66	65	81	69	65	65
33	65	65	66	65	82	69	66	65
34	65	65	66	65	83	70	66	65
35	65	65	66	65	85	71	67	65
36	65	65	66	65	86	71	67	66
37	66	66	67	66	88	72	68	67
38	66	65	67	65	89	73	68	67
39	66	65	67	65	91	74	69	67
40	66	65	67	65	92	74	69	68
41	66	65	67	65	93	75	70	68
42	66	65	67	65	95	76	70	69
43	66	65	67	65	96	77	71	69
44	66	65	67	65	98	78	72	70
45	66	66	67	65	99	79	72	70
46	66	66	67	66	100	80	73	71

OMEGA POINT LABORATORIES

Time (min)	Conduit #4 Surface TC No. 268 (°F)	Conduit #4 Surface TC No. 269 (°F)	Conduit #4 Surface TC No. 270 (°F)	Conduit #4 Surface TC No. 271 (°F)	Conduit #6 Surface TC No. 272 (°F)	Conduit #6 Surface TC No. 273 (°F)	Conduit #6 Surface TC No. 274 (°F)	Conduit #6 Surface TC No. 275 (°F)
47	66	66	67	66	101	81	74	72
48	66	66	67	66	103	82	75	72
49	66	66	67	66	104	83	76	73
50	67	66	67	66	105	85	76	74
51	67	66	68	66	107	86	77	75
52	67	66	68	66	108	87	78	75
53	67	66	68	67	109	88	79	76
54	67	67	68	67	110	89	80	77
55	68	67	69	67	111	90	81	78
56	68	67	69	67	112	91	82	79
57	68	68	69	67	113	92	83	80
58	69	68	69	68	114	94	83	81
59	69	68	70	68	115	95	84	81
60	69	68	70	68	117	96	85	82
61	69	69	70	68	118	97	86	83
62	70	69	71	69	120	98	87	84
63	70	70	71	69	121	99	88	85
64	71	70	72	69	124	101	89	86
65	71	71	72	69	126	102	90	87
66	72	71	73	70	128	104	91	88
67	73	72	73	70	130	105	92	89
68	73	72	74	71	133	107	93	90
69	74	73	74	71	135	108	94	91
70	74	74	75	71	138	110	96	92
71	75	74	76	72	140	112	97	93
72	76	75	77	72	143	115	98	94
73	76	76	77	73	145	117	99	95
74	77	77	78	73	148	120	100	96
75	78	77	79	74	150	123	102	97
76	79	78	79	74	152	126	103	98
77	79	79	80	75	154	129	105	99
78	80	80	81	75	156	133	107	100
79	81	81	82	76	158	136	108	102
80	82	81	83	77	160	140	111	103
81	83	82	83	77	161	143	113	104
82	83	83	84	78	163	147	116	106
83	84	84	85	78	164	150	119	107
84	85	85	86	79	166	152	123	108
85	86	86	87	79	167	155	126	110
86	87	86	87	80	168	157	130	112
87	88	87	88	81	169	159	134	114
88	88	88	89	81	170	161	137	117
89	89	89	90	82	171	163	141	120
90	90	90	91	83	172	164	144	123
91	91	91	91	83	173	165	148	126
92	92	91	92	83	173	166	151	129
93	93	92	93	84	174	167	153	132

Time (min)	Conduit #4 Surface TC No. 268 (°F)	Conduit #4 Surface TC No. 269 (°F)	Conduit #4 Surface TC No. 270 (°F)	Conduit #4 Surface TC No. 271 (°F)	Conduit #6 Surface TC No. 272 (°F)	Conduit #6 Surface TC No. 273 (°F)	Conduit #6 Surface TC No. 274 (°F)	Conduit #6 Surface TC No. 275 (°F)
94	94	93	94	85	175	168	155	136
95	95	94	94	85	175	169	158	140
96	95	95	95	86	176	170	159	143
97	96	96	96	87	176	170	161	147
98	97	97	97	87	177	171	162	150
99	98	98	98	88	177	171	164	153
100	99	99	99	89	178	172	165	155
101	100	99	100	89	178	173	166	157
102	101	100	101	90	178	173	167	160
103	102	101	101	91	179	173	168	162
104	103	102	102	92	179	174	168	163
105	104	103	103	92	180	174	169	164
106	105	104	104	93	180	175	169	166
107	106	106	105	94	180	175	170	167
108	107	106	106	95	181	176	171	168
109	109	108	108	96	181	176	172	169
110	110	109	109	97	182	177	172	170
111	111	110	110	98	182	177	173	171
112	112	111	111	99	183	178	174	172
113	113	112	112	100	184	179	174	173
114	114	113	113	101	184	179	175	174
115	115	114	114	101	184	180	175	175
116	116	115	115	102	185	180	176	175
117	117	116	116	103	186	181	177	176
118	119	118	117	104	186	182	177	177
119	119	118	118	105	187	182	178	178
120	121	120	119	106	187	183	179	179
121	122	121	120	107	188	184	179	179
122	123	122	121	108	188	184	180	180
123	124	123	123	109	189	185	180	181
124	126	124	124	111	189	186	181	182
125	127	126	126	112	190	187	182	183
126	128	127	127	114	191	187	183	184
127	130	128	128	114	191	187	183	184
128	131	130	130	116	191	188	184	185
129	132	131	131	117	191	189	184	186
130	134	133	133	119	192	189	185	186
131	136	135	135	121	192	190	186	188
132	137	136	137	122	192	190	186	188
133	139	138	138	123	193	190	187	189
134	140	139	140	125	193	191	188	190
135	142	141	141	127	193	192	188	190
136	143	142	142	128	194	192	189	191
137	143	142	142	128	193	191	188	190
138	145	144	143	131	193	192	189	191
139	146	145	145	132	194	193	190	192
140	148	146	146	134	195	194	191	192

Time (min)	Conduit #4 Surface TC No. 268 (°F)	Conduit #4 Surface TC No. 269 (°F)	Conduit #4 Surface TC No. 270 (°F)	Conduit #4 Surface TC No. 271 (°F)	Conduit #6 Surface TC No. 272 (°F)	Conduit #6 Surface TC No. 273 (°F)	Conduit #6 Surface TC No. 274 (°F)	Conduit #6 Surface TC No. 275 (°F)
141	149	148	148	136	195	195	192	193
142	151	149	149	138	196	195	192	194
143	153	151	150	140	196	196	193	195
144	154	152	152	141	197	197	194	195
145	155	154	153	143	197	197	194	196
146	157	155	155	144	197	197	195	197
147	158	156	156	145	197	198	195	197
148	160	158	157	145	198	199	196	198
149	161	159	158	145	199	199	197	198
150	162	160	159	146	199	200	197	199
151	163	161	160	147	199	200	198	199
152	164	162	161	147	199	201	198	200
153	165	163	162	148	199	201	198	200
154	167	165	163	149	199	202	198	200
155	168	165	164	150	198	202	198	201
156	169	166	165	151	195	201	198	201
157	170	168	166	152	193	202	198	201
158	171	168	167	153	192	202	198	201
159	172	170	168	154	191	201	199	202
160	173	171	168	155	190	200	199	202
161	174	172	169	156	189	198	199	202
162	175	173	171	157	190	197	200	203
163	177	174	172	158	190	196	199	203
164	178	175	172	159	190	195	199	203
165	179	176	173	160	191	195	199	203
166	180	177	174	161	191	195	199	203
167	181	177	175	163	191	195	198	203
168	181	178	176	163	191	196	198	204
169	183	179	176	164	192	196	198	204
170	183	180	177	165	192	197	198	204
171	184	181	179	165	193	197	199	204
172	185	181	179	166	193	197	199	204
173	186	182	180	168	193	197	199	204
174	187	183	181	168	194	198	200	204
175	188	183	181	170	195	198	200	204
176	189	185	182	171	195	198	200	205
177	190	185	183	171	195	199	200	205
178	190	186	183	172	196	199	201	205
179	191	187	184	173	196	200	201	205
180	192	187	185	174	197	200	202	205

Time (min)	Conduit #6 Surface TC No. 276 (°F)	Conduit #6 Surface TC No. 277 (°F)	Conduit #6 Surface TC No. 278 (°F)	Conduit #6 Surface TC No. 279 (°F)	Conduit #6 Surface TC No. 280 (°F)	Conduit #6 Surface TC No. 281 (°F)	Conduit #6 Surface TC No. 282 (°F)	Conduit #6 Surface TC No. 283 (°F)
0	62	61	61	61	61	61	61	61
1	62	61	62	61	61	61	61	61
2	63	62	62	62	62	62	62	62
3	63	62	63	62	62	63	62	62
4	63	62	62	62	62	62	62	62
5	63	62	62	62	62	62	62	62
6	63	62	62	62	62	62	62	62
7	63	62	62	62	62	62	62	62
8	63	62	62	62	62	62	62	62
9	63	62	62	62	62	63	62	62
10	63	62	62	62	62	64	62	62
11	63	62	63	62	62	66	62	62
12	61	60	61	60	61	66	60	60
13	58	57	57	57	59	66	56	57
14	58	57	57	57	60	69	56	57
15	63	62	62	62	67	78	62	62
16	63	62	63	62	69	81	62	63
17	63	62	63	63	71	83	63	63
18	63	62	63	63	73	86	63	63
19	63	62	63	64	75	89	63	63
20	63	62	63	64	77	90	63	63
21	64	63	63	65	78	91	63	63
22	64	63	64	66	80	93	64	64
23	64	63	64	66	81	94	64	64
24	64	63	64	67	82	95	64	64
25	64	63	64	68	83	96	65	65
26	64	63	65	69	84	97	65	65
27	64	64	65	69	86	98	66	66
28	64	64	65	70	86	99	66	66
29	65	64	66	70	87	100	66	66
30	65	64	66	71	88	101	67	67
31	65	65	67	72	89	103	68	67
32	65	65	67	72	90	103	68	68
33	66	65	68	73	91	105	69	69
34	66	66	68	74	92	105	69	69
35	66	66	68	75	93	106	70	70
36	67	66	69	75	94	107	71	71
37	67	67	70	76	95	108	73	72
38	68	67	70	77	95	108	74	74
39	68	67	71	77	96	109	76	75
40	68	68	71	78	96	109	78	77
41	69	69	71	79	97	110	81	80
42	69	69	72	79	98	110	84	83
43	70	70	73	80	98	111	88	86
44	70	70	73	81	99	112	92	90
45	71	71	74	81	100	113	96	94
46	72	71	75	82	101	114	100	98

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Surface TC No. 276 (°F)	Conduit #6 Surface TC No. 277 (°F)	Conduit #6 Surface TC No. 278 (°F)	Conduit #6 Surface TC No. 279 (°F)	Conduit #6 Surface TC No. 280 (°F)	Conduit #6 Surface TC No. 281 (°F)	Conduit #6 Surface TC No. 282 (°F)	Conduit #6 Surface TC No. 283 (°F)
47	72	72	75	83	102	116	104	102
48	73	72	76	83	102	117	108	106
49	74	73	77	84	104	118	112	110
50	74	74	77	85	104	119	116	113
51	75	75	78	85	105	121	119	117
52	75	75	79	86	106	122	123	120
53	76	76	79	87	107	124	125	123
54	77	77	80	88	108	125	128	125
55	78	78	81	88	109	126	131	128
56	79	78	82	89	110	128	133	130
57	79	79	82	90	111	129	135	132
58	80	80	83	91	112	130	137	134
59	81	81	84	92	113	132	138	135
60	82	81	85	92	114	133	140	136
61	83	82	85	93	115	134	141	137
62	83	83	86	94	116	136	142	137
63	84	84	87	95	116	137	143	138
64	85	85	88	96	117	139	144	139
65	86	85	89	97	118	141	144	139
66	87	86	90	98	119	142	145	140
67	88	87	91	98	120	144	146	140
68	89	88	91	99	121	145	147	141
69	90	89	92	100	122	147	148	142
70	91	90	93	101	123	149	148	143
71	92	91	94	102	124	150	149	143
72	93	92	95	103	124	151	150	144
73	94	93	96	104	125	152	151	145
74	95	94	97	105	126	153	152	146
75	96	95	97	105	125	155	153	146
76	97	96	98	106	127	156	154	147
77	98	97	99	106	127	157	155	148
78	99	98	100	108	128	158	155	149
79	100	99	101	108	129	159	156	150
80	102	100	103	110	130	160	157	151
81	103	101	104	110	131	161	158	151
82	104	103	105	112	132	162	159	152
83	105	104	106	112	132	163	160	153
84	106	105	107	113	133	164	161	154
85	108	106	108	114	134	165	162	155
86	109	107	109	115	135	166	162	156
87	111	108	110	116	136	167	163	156
88	112	110	111	117	137	168	164	157
89	114	111	113	118	138	169	166	158
90	115	112	114	119	139	170	166	159
91	117	114	115	120	140	171	167	160
92	119	115	116	121	141	172	168	161
93	121	117	118	123	142	173	169	161

Time (min)	Conduit #6 Surface TC No. 276 (°F)	Conduit #6 Surface TC No. 277 (°F)	Conduit #6 Surface TC No. 278 (°F)	Conduit #6 Surface TC No. 279 (°F)	Conduit #6 Surface TC No. 280 (°F)	Conduit #6 Surface TC No. 281 (°F)	Conduit #6 Surface TC No. 282 (°F)	Conduit #6 Surface TC No. 283 (°F)
94	123	118	119	124	142	174	170	162
95	125	120	120	125	143	175	171	163
96	128	121	122	126	145	176	172	164
97	132	123	123	127	145	177	173	165
98	135	125	125	128	147	178	174	166
99	139	127	126	130	148	179	175	167
100	142	130	128	131	149	180	176	168
101	146	132	130	132	150	182	177	169
102	150	135	132	134	151	183	179	170
103	153	138	134	135	152	184	180	171
104	156	141	136	137	154	185	182	172
105	158	144	138	139	155	186	183	173
106	160	147	141	141	156	187	185	175
107	163	150	143	143	158	188	187	176
108	164	153	145	144	160	189	188	177
109	166	156	149	147	161	190	191	179
110	167	159	151	149	163	191	192	180
111	169	161	154	151	164	192	194	181
112	170	163	157	153	166	193	195	182
113	171	165	159	155	167	194	197	183
114	172	167	161	158	169	195	198	184
115	173	168	163	160	170	196	198	185
116	174	170	165	162	172	197	200	186
117	175	171	167	164	173	198	200	186
118	176	173	169	166	175	199	202	188
119	177	173	171	168	176	199	202	188
120	178	175	173	170	178	200	203	189
121	179	176	174	172	179	201	204	190
122	180	177	176	173	181	201	204	190
123	181	178	177	175	182	202	205	191
124	182	179	179	177	184	203	206	192
125	183	181	181	179	186	204	206	193
126	184	182	182	180	187	204	207	194
127	184	182	183	182	188	204	206	194
128	185	183	183	183	188	204	206	195
129	186	184	185	184	190	205	207	196
130	187	185	186	185	191	205	207	196
131	188	187	187	187	192	206	208	197
132	189	187	188	188	193	206	207	198
133	190	188	189	189	194	207	208	199
134	190	189	190	190	195	207	208	199
135	191	190	190	190	195	207	207	199
136	192	190	191	191	196	207	207	200
137	191	189	190	190	195	205	206	198
138	192	190	191	191	196	205	206	199
139	192	191	192	192	196	206	206	199
140	193	192	192	193	197	206	206	200

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Surface TC No. 276 (°F)	Conduit #6 Surface TC No. 277 (°F)	Conduit #6 Surface TC No. 278 (°F)	Conduit #6 Surface TC No. 279 (°F)	Conduit #6 Surface TC No. 280 (°F)	Conduit #6 Surface TC No. 281 (°F)	Conduit #6 Surface TC No. 282 (°F)	Conduit #6 Surface TC No. 283 (°F)
141	194	192	193	193	197	206	205	200
142	194	193	194	194	198	206	206	201
143	195	194	194	195	199	206	205	201
144	196	194	195	195	199	206	205	202
145	196	195	196	196	200	206	205	202
146	197	195	196	196	200	206	205	202
147	197	196	197	197	201	206	205	203
148	198	196	197	197	201	206	205	204
149	199	197	198	198	202	207	205	204
150	199	197	198	198	202	207	205	205
151	199	198	198	198	202	207	205	205
152	199	198	199	199	203	207	206	206
153	200	198	199	199	203	207	206	206
154	200	199	199	200	203	208	206	207
155	200	199	199	200	204	208	206	208
156	201	199	199	200	204	208	206	208
157	201	199	199	200	204	209	206	209
158	201	200	200	200	204	209	206	209
159	202	200	200	200	205	210	206	210
160	202	200	200	201	205	211	207	211
161	203	201	201	201	206	211	207	212
162	203	201	201	202	208	212	208	213
163	203	201	201	202	209	213	208	214
164	203	201	201	202	207	213	209	215
165	203	202	202	202	207	214	210	216
166	204	202	202	202	206	215	210	216
167	204	202	202	203	207	215	211	217
168	204	203	202	203	207	216	212	218
169	204	204	203	203	207	217	212	219
170	204	204	203	203	207	217	213	220
171	204	204	203	204	207	218	214	221
172	204	204	203	204	207	219	215	222
173	203	204	204	204	207	220	215	222
174	204	205	204	204	207	221	216	224
175	205	205	204	205	207	222	217	224
176	205	205	205	205	207	223	218	225
177	206	206	205	205	207	224	219	226
178	206	206	205	205	207	225	220	227
179	206	206	205	205	207	226	220	228
180	206	206	205	205	207	227	222	229

Time (min)	Conduit #6 Surface TC No. 284 (°F)	Conduit #6 Surface TC No. 285 (°F)	Conduit #6 Surface TC No. 286 (°F)	Conduit #6 Surface TC No. 287 (°F)	Conduit #6 Surface TC No. 288 (°F)	Conduit #6 Surface TC No. 289 (°F)	Conduit #6 Surface TC No. 290 (°F)	Conduit #6 Surface TC No. 291 (°F)
0	60	60	60	60	60	60	60	60
1	60	60	60	60	60	60	60	60
2	61	61	61	60	61	61	61	61
3	61	61	62	61	61	61	61	61
4	61	61	62	61	61	61	61	61
5	61	61	61	60	61	61	61	60
6	61	61	61	60	61	61	61	60
7	61	61	61	60	61	61	61	60
8	61	61	61	60	61	61	61	60
9	61	61	61	60	61	61	61	61
10	61	61	62	61	61	61	61	61
11	61	61	62	61	61	61	61	61
12	59	59	60	59	59	59	59	59
13	55	55	56	55	56	56	56	55
14	55	56	56	55	56	56	56	56
15	61	61	61	60	61	61	61	60
16	61	61	61	61	61	61	61	61
17	61	61	62	61	61	61	61	61
18	61	61	62	61	61	61	61	61
19	61	61	62	61	61	61	61	61
20	61	61	62	61	61	61	61	61
21	61	61	62	61	61	61	61	61
22	61	61	62	61	61	61	61	61
23	62	61	62	61	61	61	61	61
24	62	61	62	61	61	61	61	61
25	62	61	62	61	62	61	61	61
26	62	62	62	61	62	62	61	61
27	62	62	62	61	62	62	61	61
28	62	62	62	61	62	62	61	61
29	62	61	62	61	61	61	61	61
30	63	62	62	61	62	62	61	61
31	63	62	62	61	62	62	61	61
32	63	62	62	61	62	62	61	61
33	63	62	62	61	62	62	61	61
34	63	62	62	61	62	62	61	61
35	63	62	62	61	62	62	61	61
36	64	62	62	61	62	62	61	61
37	64	63	63	62	63	62	62	62
38	64	62	62	61	62	62	62	61
39	65	63	63	62	62	62	62	61
40	65	63	63	62	62	62	62	61
41	66	63	63	62	63	62	62	62
42	67	63	63	62	63	63	62	62
43	68	63	63	62	63	63	62	62
44	69	64	63	62	63	63	62	62
45	70	64	64	62	63	63	63	62
46	71	65	64	63	63	63	63	62

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Surface TC No. 284 (°F)	Conduit #6 Surface TC No. 285 (°F)	Conduit #6 Surface TC No. 286 (°F)	Conduit #6 Surface TC No. 287 (°F)	Conduit #6 Surface TC No. 288 (°F)	Conduit #6 Surface TC No. 289 (°F)	Conduit #6 Surface TC No. 290 (°F)	Conduit #6 Surface TC No. 291 (°F)
47	72	65	64	63	63	63	63	63
48	74	66	64	63	64	63	63	63
49	76	66	65	63	64	64	63	63
50	77	67	65	64	64	64	64	63
51	79	68	66	64	65	64	64	63
52	80	68	66	64	65	65	64	64
53	82	69	67	65	65	65	64	64
54	83	70	67	65	65	65	65	64
55	85	71	68	65	66	66	65	65
56	86	72	68	66	66	66	65	65
57	88	72	69	66	67	66	66	65
58	89	73	69	67	67	67	66	66
59	90	74	70	67	67	67	67	66
60	92	75	71	68	68	67	67	66
61	93	76	71	68	68	68	67	67
62	94	77	72	69	69	68	68	67
63	95	78	73	69	69	69	68	68
64	97	79	74	70	70	69	69	68
65	98	80	74	70	70	70	69	68
66	99	81	75	71	71	70	70	69
67	100	82	76	72	72	71	70	70
68	101	83	77	72	72	72	71	70
69	102	84	77	73	73	72	72	71
70	103	85	78	74	73	73	72	72
71	104	86	79	74	74	74	73	72
72	105	87	80	75	75	74	74	73
73	106	88	81	76	75	75	74	74
74	107	89	82	77	76	76	75	74
75	108	90	83	77	77	76	76	75
76	109	91	83	78	78	77	76	76
77	110	92	84	79	78	78	77	76
78	111	93	85	80	79	79	78	77
79	112	94	86	81	80	79	79	78
80	113	95	87	81	81	80	79	79
81	114	96	88	82	82	81	80	80
82	115	97	89	83	82	82	81	81
83	117	98	90	84	83	83	82	81
84	117	99	91	85	84	83	82	82
85	118	100	91	86	85	84	83	83
86	119	101	92	86	86	85	84	84
87	121	102	93	87	86	86	85	85
88	122	103	94	88	87	87	86	86
89	123	104	95	89	88	88	87	86
90	124	105	96	90	89	88	88	88
91	125	106	97	91	90	89	88	88
92	126	107	98	92	91	90	89	89
93	126	108	99	93	92	91	90	90

Time (min)	Conduit #6 Surface TC No. 284 (°F)	Conduit #6 Surface TC No. 285 (°F)	Conduit #6 Surface TC No. 286 (°F)	Conduit #6 Surface TC No. 287 (°F)	Conduit #6 Surface TC No. 288 (°F)	Conduit #6 Surface TC No. 289 (°F)	Conduit #6 Surface TC No. 290 (°F)	Conduit #6 Surface TC No. 291 (°F)
94	128	109	100	94	92	92	91	91
95	129	110	101	95	94	93	92	92
96	130	111	102	95	94	94	93	93
97	131	112	103	97	95	95	94	94
98	132	113	104	97	96	96	95	95
99	133	114	105	99	97	97	96	96
100	134	115	106	100	98	98	97	97
101	135	116	107	101	99	99	98	98
102	136	118	108	102	100	100	99	99
103	137	119	109	103	101	101	100	100
104	138	120	110	104	103	102	101	101
105	139	121	111	105	103	103	103	102
106	140	122	113	106	104	104	104	103
107	141	123	114	107	106	105	105	105
108	142	124	115	108	107	106	106	106
109	144	126	116	109	108	107	107	107
110	145	127	117	110	109	108	108	108
111	146	128	118	112	110	110	109	109
112	147	129	120	113	112	111	111	111
113	148	130	121	114	113	112	112	112
114	149	131	122	115	114	113	113	113
115	150	132	123	116	115	114	114	114
116	151	134	124	117	117	116	115	115
117	152	134	125	119	118	117	116	116
118	154	136	127	120	120	119	118	118
119	154	137	128	121	121	119	119	119
120	156	138	129	122	122	121	121	120
121	157	140	131	124	124	122	122	122
122	158	140	132	125	125	124	123	123
123	159	142	133	127	127	125	125	124
124	160	143	135	128	128	127	126	126
125	162	145	137	130	130	129	128	127
126	163	146	138	132	131	130	129	129
127	164	147	139	133	132	131	130	130
128	164	148	141	134	133	132	131	131
129	166	150	143	136	135	135	133	133
130	167	152	144	137	137	136	135	134
131	169	153	146	139	139	138	137	136
132	169	155	147	141	140	139	138	137
133	171	156	149	142	141	141	140	139
134	172	157	150	144	143	142	141	140
135	173	158	152	145	144	143	142	142
136	174	160	153	146	146	145	144	143
137	173	159	153	146	145	145	144	143
138	174	161	154	148	147	146	145	145
139	175	162	156	149	148	148	147	146
140	176	164	157	151	150	149	148	148

Time (min)	Conduit #6 Surface TC No. 284 (°F)	Conduit #6 Surface TC No. 285 (°F)	Conduit #6 Surface TC No. 286 (°F)	Conduit #6 Surface TC No. 287 (°F)	Conduit #6 Surface TC No. 288 (°F)	Conduit #6 Surface TC No. 289 (°F)	Conduit #6 Surface TC No. 290 (°F)	Conduit #6 Surface TC No. 291 (°F)
141	177	165	159	152	151	151	150	149
142	178	166	160	154	153	152	151	151
143	180	168	162	155	154	154	153	153
144	181	169	163	157	156	155	154	154
145	182	171	165	158	157	157	156	156
146	183	172	166	159	159	158	157	157
147	184	173	167	161	160	160	159	158
148	185	175	168	162	162	161	160	160
149	186	176	170	164	163	162	161	161
150	187	177	171	165	164	164	163	163
151	189	178	172	166	166	165	164	164
152	190	180	173	167	167	167	165	165
153	191	181	174	169	169	168	166	166
154	192	182	176	170	170	169	168	167
155	193	184	177	171	171	170	169	169
156	194	184	177	172	172	171	170	170
157	195	186	179	173	173	173	171	171
158	196	187	180	175	175	174	172	172
159	198	188	181	176	176	175	173	174
160	199	190	182	177	177	176	174	175
161	200	191	184	178	178	177	175	176
162	202	192	185	180	180	179	177	178
163	203	194	186	181	181	180	178	179
164	204	195	187	182	182	181	179	180
165	205	196	189	184	183	182	180	181
166	206	197	190	185	184	183	181	182
167	207	199	191	186	185	183	182	183
168	208	200	192	187	186	184	183	184
169	209	201	193	188	187	185	184	185
170	211	202	194	189	187	186	185	187
171	212	203	195	190	188	187	187	188
172	213	204	196	191	189	188	188	189
173	214	205	197	192	190	189	189	190
174	215	207	198	193	191	190	189	190
175	216	208	199	193	192	190	189	190
176	218	209	199	194	193	191	189	191
177	218	210	200	195	193	191	190	191
178	220	211	201	196	194	192	191	192
179	221	212	202	196	195	193	191	193
180	222	213	203	197	195	193	191	193

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Surface TC No. 292 (°F)	Conduit #6 Surface TC No. 293 (°F)	Conduit #6 Surface TC No. 294 (°F)	Conduit #6 Surface TC No. 295 (°F)	Conduit #6 Surface TC No. 296 (°F)	Conduit #6 Surface TC No. 297 (°F)	Conduit #1 Surface TC No. 298 (°F)	Conduit #1 Surface TC No. 299 (°F)
0	60	60	60	61	61	61	61	62
1	60	60	60	61	61	61	61	62
2	61	61	61	62	62	62	62	62
3	61	62	61	62	62	62	62	62
4	61	61	61	62	62	62	62	62
5	61	61	61	62	62	62	62	62
6	61	61	61	62	62	62	62	62
7	61	61	61	62	62	62	62	62
8	61	61	61	62	62	62	62	62
9	61	61	61	62	62	62	62	62
10	61	61	61	62	62	62	62	62
11	61	61	61	62	62	62	62	62
12	59	60	59	60	61	60	61	61
13	56	56	56	57	57	57	58	58
14	56	56	56	57	57	57	58	58
15	61	61	61	62	62	62	62	62
16	61	61	61	62	62	62	62	62
17	61	61	61	62	62	62	62	62
18	61	61	61	62	62	62	63	62
19	61	61	61	62	62	62	63	63
20	61	62	61	62	62	63	63	63
21	61	62	61	62	62	63	63	63
22	61	62	61	62	63	63	64	63
23	61	62	61	62	63	63	64	63
24	61	62	62	62	63	63	64	64
25	61	62	62	62	63	63	65	64
26	61	62	62	62	63	63	65	64
27	61	62	62	62	63	64	66	65
28	61	62	62	62	63	64	67	65
29	61	62	61	62	63	64	67	65
30	62	62	62	62	63	64	68	66
31	62	62	62	63	63	64	69	66
32	61	62	62	62	63	64	70	67
33	61	62	62	62	63	65	71	67
34	62	62	62	62	63	65	72	68
35	62	62	62	63	63	65	73	68
36	62	62	62	63	63	65	74	69
37	62	62	62	63	64	66	76	70
38	62	62	62	63	64	66	77	71
39	62	62	62	63	64	66	79	71
40	62	62	62	63	64	66	81	72
41	62	62	62	63	64	66	82	73
42	62	63	62	63	64	67	84	74
43	62	63	62	63	64	67	86	75
44	62	63	63	63	65	67	88	76
45	62	63	63	63	65	67	90	78
46	63	63	63	64	65	68	92	79

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Surface TC No. 292 (°F)	Conduit #6 Surface TC No. 293 (°F)	Conduit #6 Surface TC No. 294 (°F)	Conduit #6 Surface TC No. 295 (°F)	Conduit #6 Surface TC No. 296 (°F)	Conduit #6 Surface TC No. 297 (°F)	Conduit #1 Surface TC No. 298 (°F)	Conduit #1 Surface TC No. 299 (°F)
47	63	63	63	64	65	68	95	80
48	63	63	63	64	65	68	97	81
49	63	64	63	64	66	69	99	83
50	64	64	64	65	66	69	101	84
51	64	64	64	65	66	70	103	85
52	64	64	64	65	66	70	105	87
53	64	65	64	65	67	70	107	88
54	65	65	65	66	67	71	108	89
55	65	65	65	66	67	71	110	91
56	65	66	65	66	68	72	112	93
57	65	66	66	67	68	72	114	94
58	66	66	66	67	69	73	116	96
59	66	67	66	67	69	73	118	97
60	67	67	67	68	70	74	120	98
61	67	67	67	68	70	74	122	100
62	67	68	67	68	71	75	124	102
63	68	68	68	69	71	75	126	103
64	68	69	68	70	72	76	129	105
65	69	69	69	70	72	76	131	107
66	69	70	69	71	73	77	134	108
67	70	70	70	71	74	77	137	110
68	70	71	70	72	74	78	140	112
69	71	72	71	73	75	79	142	114
70	72	72	72	73	76	79	145	116
71	72	73	72	74	76	80	148	118
72	73	74	73	75	77	81	151	121
73	74	74	74	75	78	81	154	124
74	75	75	75	76	79	82	157	127
75	75	76	76	77	79	83	160	130
76	76	77	76	78	80	83	162	133
77	77	77	77	78	81	84	164	137
78	77	78	78	79	82	85	166	140
79	78	79	79	80	83	85	167	144
80	79	80	80	81	83	86	169	147
81	80	81	80	82	84	87	170	150
82	81	82	81	83	85	87	171	154
83	82	83	82	83	86	88	172	156
84	83	83	83	84	86	89	173	159
85	83	84	84	85	87	90	174	161
86	84	85	85	86	88	90	174	163
87	85	86	85	87	89	91	175	165
88	86	87	86	88	90	92	176	166
89	87	88	87	89	91	92	176	168
90	88	89	88	89	92	93	177	169
91	89	90	89	90	92	94	178	170
92	90	90	90	91	93	95	178	170
93	90	91	91	92	94	95	178	171

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Surface TC No. 292 (°F)	Conduit #6 Surface TC No. 293 (°F)	Conduit #6 Surface TC No. 294 (°F)	Conduit #6 Surface TC No. 295 (°F)	Conduit #6 Surface TC No. 296 (°F)	Conduit #6 Surface TC No. 297 (°F)	Conduit #1 Surface TC No. 298 (°F)	Conduit #1 Surface TC No. 299 (°F)
94	92	92	92	93	95	96	179	172
95	93	93	93	94	95	97	180	173
96	94	94	94	95	96	98	180	173
97	94	95	95	96	97	99	180	174
98	95	96	96	97	98	99	181	174
99	97	97	97	98	99	100	181	175
100	98	98	98	99	100	101	182	175
101	99	99	99	99	101	102	182	175
102	100	101	100	101	102	103	183	176
103	101	102	101	102	103	104	183	176
104	102	103	102	103	104	104	184	176
105	103	103	103	104	105	105	184	177
106	104	104	104	104	106	106	184	177
107	105	106	105	106	107	107	185	178
108	106	107	106	106	108	108	185	178
109	108	108	107	108	109	109	186	179
110	109	109	108	109	110	110	186	179
111	110	110	109	110	111	111	187	179
112	111	112	110	111	112	112	187	180
113	112	113	112	112	113	113	188	181
114	113	114	113	113	114	114	189	181
115	114	115	113	114	115	115	189	182
116	116	116	115	115	117	116	189	183
117	117	117	116	116	117	117	190	183
118	118	119	117	117	119	118	191	184
119	119	119	118	118	119	119	191	184
120	121	121	119	120	120	120	192	185
121	122	122	121	121	122	122	192	186
122	123	123	122	122	122	124	193	186
123	124	125	123	123	124	126	193	187
124	126	126	124	125	125	128	194	188
125	128	128	126	126	127	131	195	188
126	129	129	127	128	129	133	195	189
127	130	130	128	129	130	134	195	189
128	131	131	130	130	131	136	196	190
129	133	133	131	132	133	138	196	191
130	134	135	133	133	135	140	196	191
131	136	136	134	135	137	142	197	192
132	137	138	136	136	138	144	197	192
133	139	139	137	138	140	145	198	193
134	140	140	139	139	141	147	198	194
135	142	142	140	140	143	148	198	194
136	143	143	141	142	144	150	198	195
137	143	143	141	142	144	149	197	194
138	144	145	143	143	146	151	197	194
139	146	146	144	145	147	152	197	195
140	148	148	146	146	148	153	198	196

Time (min)	Conduit #6 Surface TC No. 292 (°F)	Conduit #6 Surface TC No. 293 (°F)	Conduit #6 Surface TC No. 294 (°F)	Conduit #6 Surface TC No. 295 (°F)	Conduit #6 Surface TC No. 296 (°F)	Conduit #6 Surface TC No. 297 (°F)	Conduit #1 Surface TC No. 298 (°F)	Conduit #1 Surface TC No. 299 (°F)
141	149	149	147	148	150	155	198	196
142	151	151	149	149	151	156	198	197
143	152	152	150	150	153	157	199	197
144	154	154	152	152	154	158	199	198
145	155	155	153	153	156	159	199	198
146	157	157	155	154	157	160	200	199
147	158	158	156	155	158	160	200	199
148	160	159	157	157	158	159	200	200
149	161	161	158	158	159	159	200	200
150	162	162	160	159	160	159	201	201
151	164	163	161	160	160	159	201	201
152	165	165	162	161	161	159	201	201
153	166	166	164	162	162	160	201	202
154	167	167	165	163	162	161	201	202
155	169	168	166	164	163	161	201	203
156	170	169	167	165	164	161	201	203
157	171	171	168	166	165	162	202	203
158	173	172	169	167	166	162	202	204
159	174	173	170	168	167	164	202	204
160	175	175	172	169	168	165	202	204
161	177	176	173	170	169	165	202	205
162	178	178	174	172	170	166	202	205
163	180	179	176	173	171	167	202	205
164	181	180	177	174	172	167	202	206
165	182	182	178	175	173	168	203	206
166	183	183	179	176	174	169	203	206
167	184	184	180	176	175	170	203	207
168	185	185	182	177	175	171	203	208
169	186	186	183	178	176	171	203	209
170	187	187	183	179	177	172	204	210
171	188	188	184	180	178	173	204	211
172	189	189	185	181	179	173	204	211
173	190	190	186	182	180	175	204	212
174	190	190	187	183	180	175	205	213
175	191	191	188	184	181	176	205	214
176	191	192	188	184	182	177	205	215
177	192	193	189	185	183	177	205	216
178	192	193	189	186	184	178	205	217
179	193	194	190	186	184	179	206	219
180	194	194	191	187	185	179	206	220

Time (min)	Conduit #1 Surface TC No. 300 (°F)	Conduit #1 Surface TC No. 301 (°F)	Conduit #1 Surface TC No. 302 (°F)	Conduit #1 Surface TC No. 303 (°F)	Conduit #1 Surface TC No. 304 (°F)	Conduit #1 Surface TC No. 305 (°F)	Conduit #1 Surface TC No. 306 (°F)	Conduit #1 Surface TC No. 307 (°F)
0	61	61	60	60	60	61	60	60
1	61	61	60	60	60	61	60	60
2	62	62	61	61	61	62	61	61
3	62	62	61	62	61	62	62	61
4	62	62	61	61	61	62	61	61
5	62	62	61	61	61	62	61	61
6	62	62	61	61	61	62	61	61
7	62	62	61	61	61	62	61	61
8	62	62	61	61	61	62	61	61
9	62	62	61	61	61	63	61	61
10	62	62	61	61	62	64	61	62
11	62	62	61	61	63	66	62	62
12	60	60	60	60	63	66	60	60
13	57	57	56	57	61	65	56	56
14	57	57	56	57	63	67	56	56
15	62	62	61	62	69	74	62	62
16	62	62	61	62	71	75	62	62
17	62	62	61	62	73	76	62	63
18	62	62	61	63	74	78	63	63
19	62	62	62	63	76	80	63	63
20	62	62	62	63	77	81	63	64
21	62	62	62	64	79	83	64	64
22	62	62	62	65	81	85	64	65
23	63	62	62	65	83	87	65	65
24	63	63	62	66	84	89	65	66
25	63	63	63	66	86	91	66	67
26	63	63	63	67	88	92	67	67
27	64	63	63	68	89	93	67	68
28	64	63	63	68	90	95	68	69
29	64	63	63	69	92	96	68	69
30	64	64	64	70	93	97	69	70
31	65	64	64	71	95	98	70	71
32	65	64	64	71	96	100	71	72
33	65	65	65	72	97	101	72	73
34	66	65	65	72	98	102	73	74
35	66	65	66	73	99	103	76	75
36	67	66	66	74	101	105	80	78
37	67	66	67	75	102	107	87	82
38	68	67	67	75	103	108	93	86
39	68	67	68	76	104	110	99	91
40	69	67	68	77	106	112	105	95
41	69	68	69	78	107	114	110	100
42	70	69	69	78	109	117	115	104
43	71	69	70	79	111	119	119	107
44	71	70	71	80	112	122	122	111
45	72	71	71	81	114	124	125	114
46	73	71	72	82	116	126	127	117

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Surface TC No. 300 (°F)	Conduit #1 Surface TC No. 301 (°F)	Conduit #1 Surface TC No. 302 (°F)	Conduit #1 Surface TC No. 303 (°F)	Conduit #1 Surface TC No. 304 (°F)	Conduit #1 Surface TC No. 305 (°F)	Conduit #1 Surface TC No. 306 (°F)	Conduit #1 Surface TC No. 307 (°F)
47	74	72	73	83	118	128	130	119
48	75	73	74	85	119	130	132	122
49	76	74	75	86	121	131	134	124
50	78	75	76	87	123	133	136	126
51	78	76	76	88	124	134	138	128
52	79	77	77	89	125	135	139	130
53	80	78	78	90	127	137	141	131
54	82	79	79	91	128	138	143	133
55	83	80	80	92	129	139	144	135
56	84	81	81	93	131	141	146	136
57	85	81	82	94	132	142	148	138
58	86	82	83	95	133	144	150	139
59	87	83	84	96	134	145	152	141
60	88	84	85	98	135	147	153	142
61	89	85	86	98	136	148	155	144
62	90	86	87	99	137	150	156	145
63	92	87	87	101	139	151	157	147
64	93	88	89	102	140	153	159	148
65	94	89	89	103	141	154	160	149
66	95	90	90	104	142	156	161	150
67	96	91	92	105	143	157	162	152
68	97	92	92	105	143	158	162	153
69	99	94	94	107	144	159	164	154
70	100	94	94	107	145	161	164	155
71	101	96	96	108	146	162	165	156
72	103	97	97	110	147	163	166	157
73	104	98	98	110	147	164	167	158
74	106	99	99	112	148	164	168	159
75	107	100	100	112	149	165	169	160
76	109	101	101	113	150	166	170	161
77	111	102	102	114	150	167	171	162
78	113	104	103	115	151	168	172	163
79	116	105	105	116	151	168	173	164
80	119	106	106	117	152	169	174	166
81	122	108	107	118	152	170	175	167
82	125	109	108	119	153	171	176	168
83	129	111	109	120	154	172	177	169
84	133	112	111	121	154	172	178	170
85	137	114	112	122	155	173	179	171
86	141	116	113	123	155	174	180	172
87	145	118	114	124	156	174	181	173
88	148	120	116	125	157	175	182	174
89	152	123	117	126	158	176	183	175
90	155	126	119	127	159	177	184	176
91	158	129	121	128	159	178	185	177
92	160	133	122	130	160	178	186	178
93	162	136	124	130	161	179	187	179

Time (min)	Conduit #1 Surface TC No. 300 (°F)	Conduit #1 Surface TC No. 301 (°F)	Conduit #1 Surface TC No. 302 (°F)	Conduit #1 Surface TC No. 303 (°F)	Conduit #1 Surface TC No. 304 (°F)	Conduit #1 Surface TC No. 305 (°F)	Conduit #1 Surface TC No. 306 (°F)	Conduit #1 Surface TC No. 307 (°F)
94	164	140	126	132	162	180	188	180
95	166	144	129	133	163	181	189	181
96	167	147	132	134	164	182	190	182
97	168	150	134	135	165	183	191	183
98	169	153	138	137	166	184	191	184
99	170	156	141	139	167	185	192	185
100	171	158	144	140	168	186	193	186
101	171	160	147	142	169	187	193	187
102	172	162	151	144	170	189	194	188
103	173	164	154	146	172	191	195	189
104	173	165	157	148	173	193	195	190
105	173	167	159	150	174	195	196	191
106	174	168	161	153	175	197	196	191
107	175	169	164	156	177	199	197	193
108	175	170	165	158	178	200	197	193
109	176	171	167	161	180	202	198	195
110	176	172	168	163	181	204	198	196
111	177	173	170	165	183	205	198	197
112	177	174	171	167	185	206	199	198
113	178	175	172	169	186	208	199	199
114	179	176	173	170	188	209	200	200
115	179	177	174	172	189	210	200	200
116	180	178	175	173	191	212	200	201
117	180	178	176	174	192	213	201	202
118	181	179	177	175	194	215	201	203
119	182	180	178	176	196	215	201	204
120	183	181	179	178	197	217	202	205
121	184	182	180	179	199	218	203	206
122	184	183	180	180	200	219	203	207
123	185	184	181	181	202	220	204	208
124	186	185	182	182	204	221	205	209
125	187	186	183	184	205	223	206	211
126	188	187	184	185	207	224	207	212
127	188	187	184	186	208	225	207	213
128	188	188	185	186	209	226	208	213
129	189	189	186	188	211	228	209	215
130	190	189	187	189	212	229	211	216
131	191	190	188	190	214	230	212	218
132	191	191	189	191	215	231	213	219
133	192	192	189	192	216	232	215	220
134	193	192	190	193	217	234	216	221
135	193	193	191	194	219	235	217	223
136	194	194	192	195	220	236	218	224
137	193	193	191	194	220	235	217	223
138	194	193	192	195	221	237	218	224
139	194	194	192	196	222	238	220	225
140	195	195	193	197	224	239	221	227

Time (min)	Conduit #1 Surface TC No. 300 (°F)	Conduit #1 Surface TC No. 301 (°F)	Conduit #1 Surface TC No. 302 (°F)	Conduit #1 Surface TC No. 303 (°F)	Conduit #1 Surface TC No. 304 (°F)	Conduit #1 Surface TC No. 305 (°F)	Conduit #1 Surface TC No. 306 (°F)	Conduit #1 Surface TC No. 307 (°F)
141	195	195	194	198	225	240	222	228
142	196	196	194	199	227	242	223	229
143	197	197	195	200	228	243	224	231
144	197	197	196	201	230	244	225	232
145	198	198	196	202	231	245	226	234
146	198	198	197	203	232	247	227	235
147	199	198	197	204	234	248	229	236
148	199	199	198	205	235	249	230	238
149	200	199	198	206	236	251	231	239
150	200	200	198	207	238	252	232	240
151	201	200	199	208	239	253	233	242
152	202	200	199	209	241	255	234	243
153	202	200	199	210	242	256	235	244
154	203	201	200	211	243	257	236	246
155	203	201	200	213	244	259	238	247
156	204	201	200	213	246	260	239	248
157	205	201	200	214	247	261	240	249
158	206	201	201	215	248	262	241	251
159	206	202	201	216	250	264	242	252
160	207	202	202	218	251	265	244	254
161	208	202	202	219	252	266	245	255
162	208	202	203	220	254	268	247	257
163	209	203	204	221	255	269	248	258
164	210	203	204	222	257	271	249	260
165	211	203	205	224	258	272	251	261
166	211	204	205	225	259	273	252	262
167	212	204	205	226	261	275	253	264
168	213	204	206	227	262	276	254	265
169	213	205	206	229	263	278	256	267
170	214	205	207	230	264	279	257	268
171	215	205	208	231	266	280	259	270
172	215	206	209	232	267	282	260	271
173	216	206	210	233	268	283	261	272
174	217	206	211	235	270	285	263	274
175	218	207	211	236	271	286	265	276
176	218	208	213	237	272	287	266	277
177	220	209	214	238	274	289	267	278
178	220	209	216	240	275	290	269	280
179	222	210	217	241	276	292	270	281
180	222	211	218	242	277	293	272	283

Time (min)	Conduit #1 Surface TC No. 308 (°F)	Conduit #1 Surface TC No. 309 (°F)	Conduit #1 Surface TC No. 310 (°F)	Conduit #1 Surface TC No. 311 (°F)	Conduit #1 Surface TC No. 312 (°F)	Conduit #1 Surface TC No. 313 (°F)	Conduit #1 Surface TC No. 314 (°F)	Conduit #1 Surface TC No. 315 (°F)
0	59	59	60	60	60	59	60	60
1	59	59	60	60	60	59	60	60
2	60	60	60	61	61	60	61	61
3	61	61	61	61	61	61	62	62
4	60	60	61	61	61	61	61	61
5	60	60	61	61	61	60	61	61
6	60	60	61	61	61	60	61	61
7	60	60	60	61	61	60	61	61
8	60	60	60	61	61	60	61	61
9	60	60	61	61	61	60	61	61
10	61	60	61	61	61	61	61	61
11	61	61	61	61	61	61	61	62
12	59	59	59	59	59	59	60	60
13	55	55	55	55	55	54	55	56
14	55	55	55	55	55	55	55	56
15	60	60	60	61	61	60	61	61
16	61	60	61	61	61	61	61	61
17	61	60	61	61	61	60	61	61
18	61	61	61	61	61	61	61	61
19	61	61	61	62	61	61	61	62
20	61	61	61	62	61	61	62	62
21	61	61	61	61	61	61	62	62
22	61	61	61	62	61	61	62	62
23	61	61	61	62	61	61	62	62
24	61	61	61	62	61	61	62	62
25	62	61	61	62	61	61	62	62
26	62	61	61	62	61	61	62	62
27	62	61	61	62	62	61	62	62
28	62	61	61	62	61	61	62	62
29	62	61	61	62	61	61	62	62
30	62	61	62	62	62	61	62	62
31	63	61	62	62	62	61	62	62
32	63	61	62	62	62	61	62	62
33	63	62	62	62	62	61	62	62
34	63	62	62	62	62	61	62	62
35	64	62	62	62	62	61	62	62
36	64	62	62	62	62	61	62	62
37	65	62	63	63	62	61	62	62
38	65	62	62	62	62	61	62	62
39	66	63	63	62	62	61	62	62
40	67	63	63	63	62	61	62	62
41	68	63	63	63	62	61	62	62
42	69	64	63	63	63	62	62	62
43	70	64	64	63	63	62	62	62
44	71	64	64	63	63	62	63	62
45	73	65	64	64	63	62	63	63
46	75	66	65	64	64	62	63	63

Time (min)	Conduit #1 Surface TC No. 308 (°F)	Conduit #1 Surface TC No. 309 (°F)	Conduit #1 Surface TC No. 310 (°F)	Conduit #1 Surface TC No. 311 (°F)	Conduit #1 Surface TC No. 312 (°F)	Conduit #1 Surface TC No. 313 (°F)	Conduit #1 Surface TC No. 314 (°F)	Conduit #1 Surface TC No. 315 (°F)
47	76	66	65	65	64	62	63	63
48	78	67	66	65	64	63	63	63
49	79	68	67	66	65	63	64	63
50	81	69	67	66	65	64	64	64
51	82	70	68	67	66	64	64	64
52	84	71	68	67	66	64	65	64
53	86	72	69	68	66	64	65	64
54	87	73	70	68	67	65	65	65
55	89	74	71	69	68	65	66	65
56	91	75	72	70	68	66	66	66
57	92	76	72	71	69	66	67	66
58	93	77	73	71	70	67	67	67
59	95	79	74	72	70	68	68	67
60	97	79	75	73	71	68	68	68
61	98	80	76	74	72	69	69	68
62	99	82	77	75	73	69	69	69
63	101	83	78	76	73	70	70	69
64	102	84	79	77	74	71	71	70
65	104	85	80	78	75	71	71	70
66	105	87	81	79	76	72	72	71
67	107	88	82	80	77	73	73	72
68	108	89	83	81	78	74	73	72
69	110	90	85	82	79	75	74	73
70	111	92	86	83	80	75	75	74
71	113	93	87	84	81	76	76	75
72	114	94	88	85	82	77	77	76
73	115	95	89	86	83	78	77	76
74	117	97	90	87	84	79	78	77
75	118	98	91	88	85	80	79	78
76	120	99	93	89	86	81	80	79
77	121	101	94	90	87	81	81	80
78	123	102	95	91	88	82	82	81
79	124	103	96	92	89	84	83	82
80	126	105	97	94	91	85	84	83
81	127	106	98	94	92	86	85	83
82	129	107	100	96	93	87	85	85
83	130	109	101	97	94	88	87	86
84	131	110	102	98	95	88	87	86
85	133	111	103	98	96	89	88	87
86	134	113	104	99	97	90	89	88
87	135	114	105	100	98	91	90	89
88	136	115	106	101	99	92	91	90
89	138	116	107	102	100	93	92	91
90	139	118	108	103	101	94	93	92
91	141	119	110	104	102	95	94	93
92	142	120	111	105	103	96	95	94
93	143	122	112	106	104	97	96	94

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Surface TC No. 308 (°F)	Conduit #1 Surface TC No. 309 (°F)	Conduit #1 Surface TC No. 310 (°F)	Conduit #1 Surface TC No. 311 (°F)	Conduit #1 Surface TC No. 312 (°F)	Conduit #1 Surface TC No. 313 (°F)	Conduit #1 Surface TC No. 314 (°F)	Conduit #1 Surface TC No. 315 (°F)
94	144	123	113	107	105	98	97	95
95	145	124	115	108	106	99	98	96
96	147	126	116	109	107	100	99	98
97	148	127	117	110	108	101	100	98
98	149	129	119	112	109	102	101	99
99	151	130	120	113	110	103	102	101
100	151	131	122	114	111	104	103	101
101	153	133	123	115	112	105	104	102
102	154	134	125	117	114	106	105	104
103	155	136	126	118	115	107	106	105
104	156	137	127	119	116	109	107	105
105	158	139	129	121	118	110	108	107
106	159	140	130	122	119	111	109	108
107	160	142	132	123	120	112	111	109
108	161	143	133	125	122	113	112	110
109	163	144	135	126	123	115	113	112
110	164	146	136	128	124	116	114	113
111	165	147	138	129	125	117	116	114
112	167	149	140	130	127	119	117	115
113	168	150	141	132	128	120	118	116
114	169	151	142	133	129	121	119	117
115	170	152	143	134	130	122	120	118
116	171	154	145	135	132	123	122	120
117	172	155	146	136	132	124	123	120
118	174	157	148	138	134	125	124	122
119	174	158	149	139	135	126	125	123
120	176	159	150	141	136	127	126	124
121	177	161	152	142	138	129	127	125
122	178	162	153	143	139	129	128	126
123	180	163	155	145	141	131	130	128
124	181	165	156	146	143	132	131	129
125	183	167	158	148	145	134	133	131
126	185	169	160	150	147	135	134	132
127	186	169	160	151	149	136	135	133
128	187	170	161	152	151	137	136	134
129	189	173	164	154	154	139	138	136
130	190	174	165	155	156	141	139	137
131	192	176	166	157	158	142	141	139
132	193	177	168	159	160	143	142	140
133	195	178	169	160	163	145	143	142
134	196	180	170	162	165	147	145	143
135	198	181	172	163	167	149	146	144
136	199	182	173	165	170	150	148	146
137	199	182	172	164	171	150	147	145
138	200	183	174	166	173	151	149	147
139	202	185	175	167	175	153	150	148
140	203	187	177	169	177	155	152	150

Time (min)	Conduit #1 Surface TC No. 308 (°F)	Conduit #1 Surface TC No. 309 (°F)	Conduit #1 Surface TC No. 310 (°F)	Conduit #1 Surface TC No. 311 (°F)	Conduit #1 Surface TC No. 312 (°F)	Conduit #1 Surface TC No. 313 (°F)	Conduit #1 Surface TC No. 314 (°F)	Conduit #1 Surface TC No. 315 (°F)
141	205	188	178	170	179	157	154	151
142	207	190	180	172	181	158	155	153
143	208	191	181	174	183	160	157	154
144	210	193	183	175	184	162	158	156
145	212	194	184	177	186	163	160	157
146	213	196	186	179	187	165	161	159
147	215	198	188	180	188	167	163	160
148	216	199	190	182	190	168	164	162
149	218	201	191	184	191	170	166	163
150	219	203	193	186	192	172	167	164
151	221	204	195	187	193	173	168	166
152	223	206	197	189	194	175	170	167
153	224	208	199	191	195	176	171	168
154	226	209	200	192	195	178	172	169
155	227	211	202	194	196	179	173	171
156	229	212	204	196	197	181	174	171
157	230	214	206	197	198	182	176	173
158	232	216	207	199	199	183	177	174
159	233	218	209	201	199	185	179	175
160	235	219	211	203	200	186	180	176
161	237	221	213	205	201	187	181	177
162	239	223	215	207	202	188	183	179
163	240	225	217	208	202	190	184	180
164	242	227	219	210	203	190	185	180
165	244	229	221	212	203	191	186	181
166	245	230	223	213	204	192	188	182
167	247	232	224	215	204	194	189	183
168	248	234	226	217	204	195	190	184
169	250	236	228	218	205	196	191	185
170	252	237	230	220	205	197	193	186
171	253	239	232	222	206	198	194	187
172	255	241	233	223	207	199	195	188
173	257	242	235	225	207	201	197	189
174	258	244	237	226	208	202	198	190
175	260	246	239	228	209	203	200	191
176	261	248	241	229	210	205	201	193
177	263	249	242	231	212	206	202	194
178	265	251	244	233	215	208	204	195
179	266	253	246	234	218	209	205	196
180	268	255	247	236	221	211	207	197

Time (min)	Conduit #1 Surface TC No. 316 (°F)	Conduit #1 Surface TC No. 317 (°F)	Conduit #1 Surface TC No. 318 (°F)	Conduit #1 Surface TC No. 319 (°F)	Conduit #3 Surface TC No. 320 (°F)	Conduit #3 Surface TC No. 321 (°F)	Conduit #3 Surface TC No. 322 (°F)	Conduit #3 Surface TC No. 323 (°F)
0	62	62	63	64	67	66	65	65
1	62	62	63	65	68	66	65	65
2	63	62	64	65	68	67	66	66
3	63	63	64	66	68	67	66	66
4	63	62	64	66	68	67	66	66
5	63	62	64	65	68	67	66	66
6	63	62	64	65	68	67	66	66
7	63	62	64	65	68	67	66	66
8	63	62	64	65	68	67	66	66
9	63	62	64	65	68	67	66	66
10	63	62	64	66	68	67	66	66
11	63	63	64	66	68	67	66	66
12	62	61	63	64	67	66	65	65
13	57	57	59	60	64	62	62	61
14	58	57	59	60	64	63	62	61
15	63	62	64	65	68	67	66	66
16	63	62	64	65	69	67	66	66
17	63	62	64	66	69	67	66	66
18	63	63	64	66	69	67	67	66
19	63	63	64	66	70	68	67	66
20	63	63	65	66	70	68	67	67
21	63	63	65	66	70	68	67	67
22	63	63	65	66	70	68	67	67
23	63	63	65	66	71	69	68	67
24	63	63	65	66	72	69	68	67
25	63	63	65	66	73	69	68	68
26	63	63	65	66	73	70	69	68
27	63	63	65	67	74	70	69	69
28	63	63	65	67	75	71	69	69
29	63	63	65	67	75	71	70	69
30	64	63	65	67	77	72	70	69
31	63	63	65	67	78	72	71	70
32	63	63	65	67	79	73	71	70
33	63	63	65	67	80	74	71	71
34	63	63	65	67	81	74	72	71
35	63	63	65	68	82	75	72	71
36	63	63	65	68	83	76	73	72
37	64	64	66	68	85	77	74	73
38	64	63	65	68	86	77	74	73
39	64	63	66	68	88	78	74	73
40	64	63	66	69	89	79	75	74
41	64	63	66	69	90	80	76	74
42	64	64	66	69	92	81	76	75
43	64	64	66	70	93	82	77	76
44	64	64	66	70	95	83	78	77
45	64	64	66	71	96	85	79	78
46	64	64	67	71	98	86	80	79

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Surface TC No. 316 (°F)	Conduit #1 Surface TC No. 317 (°F)	Conduit #1 Surface TC No. 318 (°F)	Conduit #1 Surface TC No. 319 (°F)	Conduit #3 Surface TC No. 320 (°F)	Conduit #3 Surface TC No. 321 (°F)	Conduit #3 Surface TC No. 322 (°F)	Conduit #3 Surface TC No. 323 (°F)
47	65	64	67	72	99	87	81	80
48	65	64	67	73	100	88	82	81
49	65	65	68	73	102	90	83	82
50	65	65	68	74	104	91	84	83
51	66	65	68	75	106	92	85	84
52	66	66	68	76	107	94	86	85
53	66	66	69	77	109	95	87	85
54	67	66	69	78	110	96	88	87
55	67	67	70	78	112	98	89	87
56	67	67	71	79	113	99	90	88
57	68	67	71	80	115	101	91	89
58	68	68	72	81	116	102	92	90
59	69	69	72	82	118	104	93	91
60	69	69	73	82	120	105	94	92
61	70	70	73	83	122	107	95	93
62	70	70	74	84	124	108	96	94
63	71	71	75	85	126	110	97	94
64	71	72	76	86	128	112	98	95
65	72	72	76	86	131	114	99	96
66	73	73	77	87	133	115	101	97
67	73	74	78	88	136	117	102	98
68	74	74	79	88	139	119	103	99
69	75	75	80	89	142	121	104	100
70	76	76	80	90	145	123	106	101
71	76	77	81	91	148	126	107	102
72	77	78	82	92	151	129	108	103
73	78	78	83	92	154	132	110	104
74	79	79	84	93	156	136	112	105
75	80	80	85	94	158	140	114	106
76	81	81	86	95	160	144	116	107
77	81	82	86	96	162	148	118	108
78	82	83	87	96	163	151	121	110
79	83	84	88	97	164	155	124	111
80	85	85	89	98	165	158	128	112
81	85	86	90	99	167	161	132	114
82	86	87	91	100	167	164	136	116
83	87	88	92	101	168	166	141	117
84	88	89	93	101	168	168	145	119
85	89	89	94	102	169	169	149	121
86	90	90	95	103	169	170	153	124
87	91	91	95	103	169	171	156	127
88	92	92	96	104	170	172	159	130
89	93	93	97	105	170	172	162	134
90	94	94	98	106	171	173	165	138
91	95	95	99	107	171	174	167	143
92	95	96	100	107	172	174	169	147
93	96	96	101	108	172	175	170	151

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Surface TC No. 316 (°F)	Conduit #1 Surface TC No. 317 (°F)	Conduit #1 Surface TC No. 318 (°F)	Conduit #1 Surface TC No. 319 (°F)	Conduit #3 Surface TC No. 320 (°F)	Conduit #3 Surface TC No. 321 (°F)	Conduit #3 Surface TC No. 322 (°F)	Conduit #3 Surface TC No. 323 (°F)
94	97	97	101	109	172	175	171	155
95	98	98	102	110	174	175	172	159
96	99	99	103	110	174	176	173	162
97	100	100	104	111	174	176	174	164
98	101	101	105	112	175	177	175	167
99	102	102	106	113	175	177	175	168
100	103	103	107	114	176	177	176	170
101	104	104	108	115	176	178	176	171
102	105	105	109	116	176	178	177	172
103	106	107	110	117	178	179	177	173
104	107	107	111	117	178	179	177	174
105	108	109	112	118	178	179	178	175
106	110	110	113	119	179	180	178	175
107	111	111	114	121	179	180	179	176
108	112	112	115	122	180	180	179	176
109	113	113	116	123	181	181	180	177
110	114	114	118	124	182	182	180	178
111	116	115	119	126	182	182	180	179
112	117	117	120	127	183	183	181	179
113	118	118	121	128	184	184	182	180
114	119	119	123	130	185	184	182	181
115	120	120	123	131	186	185	183	181
116	122	121	125	133	187	186	183	182
117	122	122	125	134	188	186	184	182
118	124	123	127	136	189	188	185	183
119	125	124	128	138	190	188	186	184
120	126	125	129	140	191	189	186	185
121	127	127	130	142	192	190	187	185
122	128	128	131	145	193	191	188	186
123	130	129	133	147	194	191	189	187
124	131	130	134	149	195	192	189	188
125	132	132	136	151	196	193	190	188
126	134	134	138	153	197	193	191	189
127	134	134	138	154	196	193	191	189
128	136	136	140	156	197	194	191	190
129	137	137	141	158	197	194	192	191
130	139	139	143	160	198	195	193	192
131	140	140	144	162	199	195	193	192
132	141	141	146	163	199	196	193	193
133	143	143	147	165	199	197	194	193
134	144	145	149	167	199	197	195	194
135	146	146	150	168	199	198	195	195
136	147	147	152	170	199	198	196	195
137	146	147	151	169	198	197	195	194
138	148	148	153	171	198	197	195	195
139	149	150	154	172	198	198	196	195
140	151	151	156	173	198	198	197	196

Time (min)	Conduit #1 Surface TC No. 316 (°F)	Conduit #1 Surface TC No. 317 (°F)	Conduit #1 Surface TC No. 318 (°F)	Conduit #1 Surface TC No. 319 (°F)	Conduit #3 Surface TC No. 320 (°F)	Conduit #3 Surface TC No. 321 (°F)	Conduit #3 Surface TC No. 322 (°F)	Conduit #3 Surface TC No. 323 (°F)
141	153	153	157	174	198	198	197	196
142	154	154	158	175	198	199	197	197
143	156	156	160	176	199	199	198	197
144	157	157	161	177	199	199	198	198
145	158	159	163	178	200	200	199	198
146	160	160	164	178	200	200	199	198
147	161	162	165	179	200	200	200	199
148	163	163	167	180	201	201	200	199
149	164	165	168	180	201	201	200	200
150	165	166	169	181	201	201	201	200
151	166	167	170	182	201	201	201	200
152	168	168	171	182	201	202	201	200
153	169	169	172	183	202	202	201	201
154	170	171	174	184	202	202	201	201
155	171	172	175	184	202	201	202	201
156	172	173	176	185	201	201	201	201
157	173	174	177	185	202	201	201	201
158	174	175	177	186	201	201	201	201
159	175	176	179	186	201	202	202	201
160	176	177	180	187	202	200	202	201
161	177	178	181	188	202	201	202	201
162	179	179	182	189	202	201	202	201
163	180	181	183	189	202	201	202	201
164	180	181	184	190	202	202	202	201
165	181	183	185	190	201	201	201	201
166	182	184	186	191	202	201	202	201
167	183	184	187	191	202	201	201	202
168	184	185	188	192	203	202	202	202
169	185	186	189	192	203	202	202	202
170	185	187	190	193	203	202	202	202
171	186	188	190	193	203	202	202	203
172	187	189	191	194	203	202	202	203
173	188	190	192	194	203	203	204	203
174	188	191	193	195	204	204	204	203
175	189	192	193	195	203	203	204	204
176	190	193	194	196	203	203	204	204
177	190	193	195	197	204	203	204	204
178	191	194	195	197	205	204	204	204
179	192	195	196	197	205	204	204	204
180	193	196	197	198	205	204	204	204

Time (min)	Conduit #3 Surface TC No. 324 (°F)	Conduit #3 Surface TC No. 325 (°F)	Conduit #3 Surface TC No. 326 (°F)	Conduit #3 Surface TC No. 327 (°F)	Conduit #3 Surface TC No. 328 (°F)	Conduit #3 Surface TC No. 329 (°F)	Conduit #3 Surface TC No. 330 (°F)	Conduit #3 Surface TC No. 331 (°F)
0	65	64	64	64	64	63	63	63
1	65	64	64	64	64	63	63	64
2	65	64	65	65	65	64	64	65
3	66	65	65	65	65	64	64	65
4	65	64	65	65	65	64	64	65
5	65	64	65	65	64	64	64	64
6	65	64	65	65	64	64	64	64
7	65	64	65	65	65	64	64	64
8	65	64	65	65	65	64	64	64
9	65	64	65	65	65	64	64	65
10	65	65	65	65	65	65	64	65
11	65	65	65	65	65	65	64	65
12	64	63	64	64	64	64	63	63
13	60	60	61	61	59	60	58	59
14	61	60	61	62	59	60	58	59
15	65	65	67	67	65	66	64	65
16	65	65	69	69	65	66	64	65
17	66	65	70	70	65	66	64	65
18	66	66	72	72	66	67	64	65
19	66	66	73	74	66	67	64	65
20	66	66	75	76	66	68	64	65
21	66	67	77	78	66	68	64	65
22	67	67	79	80	66	69	65	65
23	67	68	81	82	67	70	65	65
24	67	68	82	84	67	70	65	65
25	67	69	84	86	68	71	65	65
26	68	69	86	88	68	71	65	65
27	68	70	87	90	68	72	66	65
28	68	71	89	92	69	73	66	65
29	69	71	91	94	69	74	66	65
30	69	72	93	97	70	75	66	66
31	70	73	95	99	70	77	66	66
32	70	74	97	101	71	78	67	66
33	70	74	98	103	72	80	67	66
34	71	75	100	105	73	81	67	66
35	71	76	102	107	74	83	68	66
36	72	77	104	110	75	85	68	67
37	72	78	106	112	76	87	69	67
38	73	78	108	114	77	89	69	67
39	73	79	110	115	78	91	70	68
40	74	80	111	117	79	93	71	68
41	74	81	113	119	80	95	71	68
42	75	82	115	121	82	97	72	69
43	76	83	117	122	83	100	73	70
44	77	84	118	124	85	102	74	70
45	78	86	120	126	86	105	75	71
46	78	87	121	128	89	108	76	72

OMEGA POINT LABORATORIES

Time (min)	Conduit #3 Surface TC No. 324 (°F)	Conduit #3 Surface TC No. 325 (°F)	Conduit #3 Surface TC No. 326 (°F)	Conduit #3 Surface TC No. 327 (°F)	Conduit #3 Surface TC No. 328 (°F)	Conduit #3 Surface TC No. 329 (°F)	Conduit #3 Surface TC No. 330 (°F)	Conduit #3 Surface TC No. 331 (°F)
47	79	88	123	130	91	111	78	72
48	80	89	125	133	94	115	79	73
49	81	90	126	135	97	118	80	74
50	82	91	128	137	99	121	82	75
51	83	93	129	139	102	124	83	77
52	84	94	131	140	104	126	85	78
53	85	95	132	142	106	129	86	79
54	86	96	133	143	109	132	88	81
55	87	97	134	145	111	134	89	82
56	88	98	136	146	113	136	91	84
57	89	98	137	148	116	139	93	85
58	90	100	138	149	118	141	95	87
59	90	100	139	150	121	143	97	89
60	91	101	139	151	124	146	98	90
61	92	102	140	152	127	149	100	91
62	93	103	141	153	130	151	102	93
63	94	104	142	154	133	154	104	95
64	95	104	142	155	136	157	106	96
65	95	105	143	156	139	159	107	98
66	96	106	144	157	142	161	109	99
67	97	106	144	159	144	163	111	101
68	98	107	145	160	146	165	113	102
69	99	108	146	161	148	167	115	103
70	100	109	146	162	150	168	116	105
71	101	110	147	164	152	169	118	106
72	101	111	148	165	154	170	120	107
73	102	111	149	166	155	171	121	108
74	103	112	149	167	156	172	123	110
75	104	113	150	168	158	173	124	111
76	105	114	151	169	159	174	126	112
77	106	115	151	169	161	174	127	113
78	107	115	152	170	162	176	129	114
79	108	116	152	171	164	177	130	115
80	110	117	153	172	166	178	131	116
81	111	118	154	173	167	179	132	117
82	112	119	154	173	169	180	134	118
83	113	120	155	174	170	181	135	119
84	114	121	155	175	171	182	136	120
85	115	122	156	175	172	183	137	120
86	116	123	156	176	174	184	138	121
87	118	123	157	177	175	184	139	122
88	119	125	157	177	176	185	140	123
89	121	125	158	178	177	186	142	124
90	123	127	159	179	178	187	143	125
91	125	128	159	180	179	188	144	126
92	127	129	160	180	180	188	145	126
93	129	129	160	181	181	189	146	127

Time (min)	Conduit #3 Surface TC No. 324 (°F)	Conduit #3 Surface TC No. 325 (°F)	Conduit #3 Surface TC No. 326 (°F)	Conduit #3 Surface TC No. 327 (°F)	Conduit #3 Surface TC No. 328 (°F)	Conduit #3 Surface TC No. 329 (°F)	Conduit #3 Surface TC No. 330 (°F)	Conduit #3 Surface TC No. 331 (°F)
94	132	131	161	181	182	189	147	128
95	135	132	162	182	183	190	148	129
96	138	133	163	183	184	191	149	130
97	142	135	164	184	185	192	149	131
98	146	136	164	185	187	193	151	132
99	149	138	166	186	188	194	152	134
100	153	140	166	186	189	194	152	135
101	156	142	167	187	190	195	153	136
102	159	144	168	188	191	196	155	137
103	162	147	169	189	192	197	156	138
104	165	150	171	190	193	198	157	139
105	167	153	172	191	194	199	158	140
106	169	156	173	193	195	200	159	141
107	171	159	174	194	195	200	160	142
108	172	161	176	195	196	201	160	143
109	173	164	177	197	197	202	162	145
110	174	166	179	198	197	203	163	146
111	175	168	180	199	198	203	164	147
112	176	170	182	201	199	204	165	148
113	177	171	183	202	200	205	166	149
114	178	173	185	203	200	205	167	150
115	178	174	186	204	201	206	168	151
116	179	175	187	205	201	206	169	152
117	180	176	189	206	201	206	170	153
118	181	177	190	207	202	208	171	155
119	181	178	191	207	203	208	172	156
120	182	179	193	209	203	208	173	158
121	183	180	194	209	204	209	174	159
122	184	181	195	210	204	209	175	160
123	185	182	197	211	205	210	177	162
124	186	183	198	212	205	211	178	163
125	187	185	199	213	206	212	179	165
126	188	186	201	214	207	212	181	166
127	188	186	201	214	207	212	181	167
128	189	187	202	215	207	212	182	168
129	189	188	204	216	208	213	184	170
130	190	189	205	217	208	214	185	172
131	191	190	206	217	208	214	186	174
132	191	191	207	218	208	214	187	175
133	192	192	208	219	209	215	188	177
134	193	193	209	220	209	215	189	178
135	194	194	209	220	209	216	190	180
136	195	194	210	221	209	216	191	181
137	194	193	209	220	207	215	190	180
138	194	194	211	221	208	215	192	182
139	195	194	211	222	208	216	193	183
140	195	195	212	223	208	216	194	184

Time (min)	Conduit #3 Surface TC No. 324 (°F)	Conduit #3 Surface TC No. 325 (°F)	Conduit #3 Surface TC No. 326 (°F)	Conduit #3 Surface TC No. 327 (°F)	Conduit #3 Surface TC No. 328 (°F)	Conduit #3 Surface TC No. 329 (°F)	Conduit #3 Surface TC No. 330 (°F)	Conduit #3 Surface TC No. 331 (°F)
141	196	195	213	224	208	217	195	186
142	196	196	214	225	208	217	196	187
143	197	197	215	225	208	217	197	188
144	197	197	216	226	208	218	198	189
145	198	198	217	227	208	219	199	191
146	198	198	218	228	209	219	200	192
147	199	198	218	229	209	220	201	193
148	199	199	219	230	209	220	203	195
149	199	199	220	231	209	221	204	196
150	200	200	221	232	210	222	205	197
151	200	200	222	233	210	222	206	198
152	200	200	222	234	210	223	207	200
153	200	200	223	235	210	224	208	201
154	201	201	224	236	211	224	209	202
155	201	201	225	237	211	225	210	204
156	201	201	225	237	211	225	211	205
157	201	201	226	238	212	226	212	206
158	201	201	227	240	212	227	213	207
159	201	201	227	241	213	228	214	209
160	201	201	228	242	214	229	216	210
161	201	201	229	243	214	230	217	212
162	201	202	230	244	215	231	218	214
163	201	202	231	245	216	231	219	215
164	201	202	232	246	217	232	221	216
165	202	203	233	247	217	233	222	218
166	202	203	234	249	218	234	223	219
167	202	203	234	250	219	235	224	221
168	202	203	235	251	219	236	225	222
169	202	204	236	252	220	237	226	224
170	203	204	237	253	221	238	228	225
171	203	205	238	254	222	239	229	227
172	203	205	239	255	223	240	230	228
173	204	206	240	256	223	241	232	230
174	204	206	241	257	224	242	233	231
175	204	207	242	258	225	243	234	233
176	205	207	243	259	226	244	235	234
177	205	208	244	260	227	245	236	236
178	205	208	245	261	228	246	238	237
179	205	210	246	263	229	247	239	239
180	206	213	247	264	230	248	240	240

Time (min)	Conduit #3 Surface TC No. 332 (°F)	Conduit #3 Surface TC No. 333 (°F)	Conduit #3 Surface TC No. 334 (°F)	Conduit #3 Surface TC No. 335 (°F)	Conduit #3 Surface TC No. 336 (°F)	Conduit #3 Surface TC No. 337 (°F)	Conduit #3 Surface TC No. 338 (°F)	Conduit #3 Surface TC No. 339 (°F)
0	63	63	64	63	63	63	63	63
1	63	63	64	63	63	63	63	63
2	64	64	65	64	64	64	64	64
3	64	64	65	64	64	64	64	64
4	64	64	65	64	64	64	64	64
5	64	64	64	64	64	64	64	64
6	64	64	64	64	64	64	64	64
7	64	64	64	64	64	64	64	64
8	64	64	64	64	64	64	64	64
9	64	64	65	64	64	64	64	64
10	64	64	65	64	64	64	64	64
11	64	64	65	64	64	64	64	64
12	63	63	63	63	63	63	63	63
13	58	59	59	59	59	59	59	59
14	58	59	59	59	59	59	59	59
15	64	64	64	64	64	64	64	64
16	64	64	65	64	64	64	64	64
17	64	64	65	64	64	64	64	64
18	64	64	65	64	64	64	64	64
19	64	64	65	64	64	64	64	64
20	64	64	65	64	64	64	64	64
21	64	64	65	64	64	64	64	64
22	64	64	65	64	65	64	65	64
23	64	65	65	64	65	64	65	64
24	64	65	65	64	65	64	65	64
25	64	65	65	64	65	64	65	64
26	64	65	65	64	65	64	65	64
27	65	65	65	64	65	65	65	64
28	64	65	65	64	65	64	65	64
29	64	65	65	64	65	64	65	64
30	65	65	65	64	65	65	65	64
31	65	65	65	64	65	65	65	65
32	65	65	65	64	65	64	65	64
33	65	65	65	64	65	64	65	64
34	65	65	65	64	65	64	65	64
35	65	65	65	64	65	64	65	64
36	65	65	65	64	65	64	65	64
37	66	66	66	65	65	65	65	65
38	66	66	66	65	65	65	65	65
39	66	66	66	65	65	65	65	65
40	66	66	66	65	65	65	65	65
41	66	66	66	65	65	65	65	65
42	67	67	67	65	65	65	65	65
43	67	67	67	65	65	65	65	65
44	68	67	67	65	66	65	65	65
45	68	68	68	66	66	65	65	65
46	69	68	68	66	66	65	66	65

Time (min)	Conduit #3 Surface TC No. 332 (°F)	Conduit #3 Surface TC No. 333 (°F)	Conduit #3 Surface TC No. 334 (°F)	Conduit #3 Surface TC No. 335 (°F)	Conduit #3 Surface TC No. 336 (°F)	Conduit #3 Surface TC No. 337 (°F)	Conduit #3 Surface TC No. 338 (°F)	Conduit #3 Surface TC No. 339 (°F)
47	69	69	69	66	66	65	66	65
48	70	69	69	67	66	66	66	66
49	71	70	70	67	67	66	66	66
50	72	71	70	67	67	66	66	66
51	73	72	71	68	67	67	67	66
52	74	73	72	69	68	67	67	67
53	75	73	72	69	68	67	67	67
54	76	74	73	70	69	68	68	68
55	78	75	74	71	69	68	68	68
56	79	76	75	71	70	69	69	68
57	80	77	76	72	71	70	69	69
58	81	78	77	73	71	70	70	70
59	83	80	78	74	72	71	71	70
60	84	81	79	75	73	72	71	71
61	85	82	80	75	73	72	72	72
62	86	83	81	76	74	73	73	72
63	88	84	82	77	75	74	73	73
64	89	85	84	78	76	75	74	74
65	90	86	85	79	77	75	75	74
66	92	87	86	80	78	76	76	75
67	93	88	87	81	79	77	77	76
68	94	89	88	82	80	78	77	77
69	95	91	89	84	81	79	78	78
70	97	92	90	85	82	80	79	79
71	98	93	91	86	83	81	80	80
72	99	94	92	87	84	82	81	81
73	100	95	94	88	85	83	82	81
74	101	96	95	89	86	84	83	83
75	102	97	96	90	87	84	84	83
76	103	98	97	91	88	85	85	84
77	104	99	97	92	89	86	86	85
78	105	100	99	93	90	87	87	86
79	106	101	99	94	91	88	88	87
80	107	102	100	96	93	89	89	88
81	108	102	101	96	94	90	90	89
82	109	103	102	98	94	91	91	90
83	110	104	103	98	96	92	91	91
84	111	105	103	99	96	93	92	92
85	111	105	104	100	97	94	93	92
86	112	106	105	101	98	94	94	93
87	113	107	105	101	99	95	95	94
88	114	108	106	102	100	96	95	95
89	115	109	107	103	101	97	96	96
90	115	110	108	104	102	98	97	97
91	116	111	108	105	102	99	98	98
92	117	112	109	105	103	100	99	99
93	118	112	110	106	104	100	100	99

OMEGA POINT LABORATORIES

Time (min)	Conduit #3 Surface TC No. 332 (°F)	Conduit #3 Surface TC No. 333 (°F)	Conduit #3 Surface TC No. 334 (°F)	Conduit #3 Surface TC No. 335 (°F)	Conduit #3 Surface TC No. 336 (°F)	Conduit #3 Surface TC No. 337 (°F)	Conduit #3 Surface TC No. 338 (°F)	Conduit #3 Surface TC No. 339 (°F)
94	118	113	111	107	105	101	101	100
95	120	114	112	108	106	102	102	101
96	121	115	112	109	107	103	103	102
97	121	116	113	110	107	104	103	103
98	122	117	114	111	108	105	104	104
99	123	119	115	112	109	106	105	105
100	125	120	116	112	110	107	106	106
101	125	120	117	113	111	108	107	107
102	127	122	119	114	112	109	108	108
103	128	123	120	115	113	110	109	109
104	129	124	121	116	114	111	111	110
105	130	125	122	117	115	112	111	111
106	131	126	123	119	116	113	112	112
107	132	127	124	120	118	114	114	113
108	133	128	125	121	119	115	114	114
109	134	130	127	122	120	117	116	115
110	135	131	128	123	121	118	117	116
111	136	132	129	124	122	119	118	118
112	138	133	130	126	123	120	120	119
113	139	134	131	127	125	121	120	120
114	140	135	132	128	126	122	122	121
115	140	136	132	128	126	123	122	122
116	141	137	133	129	127	124	123	122
117	142	138	133	129	128	124	124	123
118	144	139	134	130	129	125	125	124
119	144	140	135	130	129	126	125	125
120	146	141	136	131	130	127	126	126
121	147	143	137	132	131	128	127	127
122	148	144	138	133	132	129	128	128
123	150	145	139	134	134	130	130	129
124	151	147	140	136	135	132	131	131
125	153	148	142	137	136	133	132	132
126	154	150	143	138	138	134	134	134
127	156	151	144	139	139	136	135	135
128	157	152	146	141	140	137	136	136
129	159	154	148	142	142	139	138	138
130	161	156	149	144	143	140	139	139
131	163	158	151	145	145	141	141	141
132	165	159	152	147	146	143	142	142
133	168	161	154	148	148	145	144	144
134	170	163	156	150	149	146	145	145
135	172	165	157	152	151	147	147	147
136	173	167	159	153	152	149	148	148
137	173	166	158	153	152	149	148	148
138	174	168	160	154	153	150	149	149
139	176	170	162	156	155	152	151	151
140	177	171	163	157	156	153	152	153

Time (min)	Conduit #3 Surface TC No. 332 (°F)	Conduit #3 Surface TC No. 333 (°F)	Conduit #3 Surface TC No. 334 (°F)	Conduit #3 Surface TC No. 335 (°F)	Conduit #3 Surface TC No. 336 (°F)	Conduit #3 Surface TC No. 337 (°F)	Conduit #3 Surface TC No. 338 (°F)	Conduit #3 Surface TC No. 339 (°F)
141	179	173	165	159	158	155	154	154
142	180	174	167	160	159	156	155	155
143	181	175	168	162	161	158	157	157
144	183	177	170	163	162	159	158	158
145	184	178	171	165	164	161	160	160
146	185	180	173	166	165	162	161	161
147	186	181	174	167	166	163	162	162
148	187	182	176	168	168	165	164	164
149	188	183	177	170	169	166	165	165
150	189	184	179	171	170	167	166	166
151	190	185	180	172	171	168	168	168
152	190	186	181	173	172	170	169	169
153	191	187	182	174	173	171	170	170
154	192	188	183	175	174	172	171	171
155	193	189	184	176	175	173	172	172
156	193	190	185	177	176	174	172	173
157	195	191	186	178	177	174	174	173
158	198	192	187	179	178	175	175	175
159	200	193	188	180	179	176	175	175
160	202	194	188	181	180	177	177	177
161	204	197	189	182	181	179	178	178
162	206	199	190	183	182	179	179	178
163	208	201	191	183	183	180	180	180
164	209	203	191	184	184	181	181	180
165	211	205	192	185	184	182	181	181
166	213	206	193	185	185	183	182	182
167	214	208	194	186	186	184	183	183
168	216	210	196	187	187	185	184	183
169	217	211	199	187	188	185	184	184
170	219	213	201	188	188	186	185	185
171	221	215	202	189	189	187	185	185
172	222	217	204	189	190	188	186	186
173	224	218	206	190	191	188	187	187
174	226	220	207	191	192	189	188	187
175	227	221	209	192	192	190	188	188
176	229	223	211	193	193	191	189	189
177	230	225	212	194	193	192	189	189
178	232	226	214	195	194	193	190	190
179	233	228	215	195	195	193	190	190
180	235	229	217	196	196	194	191	191

Time (min)	Conduit #3 Surface TC No. 340 (°F)	Conduit #3 Surface TC No. 341 (°F)	Conduit #5 Surface TC No. 342 (°F)	Conduit #5 Surface TC No. 343 (°F)	Conduit #5 Surface TC No. 344 (°F)	Conduit #5 Surface TC No. 345 (°F)	Conduit #5 Surface TC No. 346 (°F)	Conduit #5 Surface TC No. 347 (°F)
0	64	64	64	64	63	63	63	63
1	64	64	64	64	63	63	63	63
2	65	65	65	65	64	64	63	64
3	65	65	65	65	64	64	64	64
4	65	65	65	65	64	64	63	64
5	65	65	65	65	64	64	63	64
6	64	65	65	64	64	64	63	64
7	64	65	65	65	64	64	63	64
8	64	65	65	65	64	64	63	64
9	65	65	65	65	64	64	63	64
10	65	65	65	65	64	64	63	64
11	65	65	65	65	64	64	64	64
12	63	64	64	64	63	63	62	63
13	59	60	60	60	59	59	58	59
14	59	60	60	60	59	59	59	60
15	65	65	65	65	64	64	63	66
16	65	65	65	65	64	64	64	67
17	65	65	65	65	64	64	64	68
18	65	65	65	65	64	64	64	70
19	65	65	66	65	64	64	65	71
20	65	65	66	65	64	65	65	73
21	65	65	66	65	64	65	65	75
22	65	65	67	65	65	65	66	76
23	65	66	68	66	65	65	66	78
24	65	66	68	66	65	65	67	80
25	65	66	69	66	65	65	67	81
26	65	66	69	67	65	66	68	82
27	65	66	70	67	66	66	69	83
28	65	66	71	67	66	66	69	84
29	65	66	71	68	66	66	70	85
30	65	66	72	68	67	67	70	86
31	65	66	73	69	67	67	71	86
32	65	66	74	69	67	68	71	87
33	65	66	74	70	68	68	72	88
34	65	66	75	70	68	68	72	88
35	65	66	76	71	69	69	73	89
36	65	66	77	71	69	69	73	89
37	66	66	79	72	70	70	74	90
38	65	66	80	73	70	70	74	90
39	65	66	81	74	71	71	75	91
40	65	66	83	74	71	71	75	91
41	66	66	84	75	72	72	76	91
42	66	66	85	76	72	72	76	92
43	66	67	87	77	73	73	77	92
44	66	67	88	78	74	73	77	93
45	66	67	90	79	74	74	78	93
46	66	67	91	80	75	74	79	94

OMEGA POINT LABORATORIES

Time (min)	Conduit #3 Surface TC No. 340 (°F)	Conduit #3 Surface TC No. 341 (°F)	Conduit #5 Surface TC No. 342 (°F)	Conduit #5 Surface TC No. 343 (°F)	Conduit #5 Surface TC No. 344 (°F)	Conduit #5 Surface TC No. 345 (°F)	Conduit #5 Surface TC No. 346 (°F)	Conduit #5 Surface TC No. 347 (°F)
47	66	67	93	81	76	75	79	95
48	67	68	94	83	77	76	80	96
49	67	68	96	84	78	77	81	97
50	67	68	97	85	79	77	81	97
51	68	69	99	86	80	78	82	98
52	68	69	100	88	81	79	83	99
53	68	69	102	89	82	80	83	99
54	69	70	103	90	83	81	84	100
55	69	70	105	92	84	82	85	101
56	70	71	106	93	85	83	85	102
57	70	71	108	94	86	83	86	103
58	71	72	110	96	87	84	87	104
59	71	72	111	97	88	85	88	104
60	72	73	112	99	89	86	89	105
61	72	73	114	100	91	87	90	106
62	73	74	116	101	92	88	90	107
63	74	74	118	103	93	89	91	108
64	75	75	120	105	94	90	92	108
65	75	75	121	106	95	91	93	109
66	76	76	124	108	96	92	94	110
67	77	77	126	110	97	93	95	111
68	78	77	128	111	99	94	96	112
69	78	78	131	113	100	95	97	113
70	79	78	133	115	101	96	98	114
71	80	79	136	117	103	97	99	115
72	81	80	139	120	104	98	100	115
73	82	81	142	122	105	99	101	116
74	83	81	145	125	107	101	102	117
75	84	82	148	128	109	102	103	118
76	84	83	151	131	110	103	104	119
77	85	83	153	135	112	104	105	120
78	86	84	155	138	114	105	106	121
79	87	85	157	142	116	106	107	122
80	88	86	159	146	119	108	108	123
81	89	87	160	149	122	109	109	124
82	90	88	162	153	125	111	110	125
83	91	88	163	156	129	112	112	126
84	92	89	165	158	133	114	113	126
85	92	90	166	160	136	115	114	127
86	93	90	167	163	140	117	115	128
87	94	91	168	164	144	119	117	129
88	95	92	168	166	148	122	118	130
89	96	93	169	167	151	124	119	131
90	97	93	170	169	155	127	121	132
91	98	94	171	170	157	130	123	133
92	98	95	171	171	160	133	124	134
93	99	96	171	171	162	137	126	135

Time (min)	Conduit #3 Surface TC No. 340 (°F)	Conduit #3 Surface TC No. 341 (°F)	Conduit #5 Surface TC No. 342 (°F)	Conduit #5 Surface TC No. 343 (°F)	Conduit #5 Surface TC No. 344 (°F)	Conduit #5 Surface TC No. 345 (°F)	Conduit #5 Surface TC No. 346 (°F)	Conduit #5 Surface TC No. 347 (°F)
94	100	96	172	172	164	140	128	137
95	101	98	172	173	166	144	130	138
96	102	98	173	173	167	148	133	139
97	103	99	173	173	169	151	136	140
98	104	100	174	174	170	154	139	141
99	105	101	174	174	171	157	142	143
100	106	102	175	175	172	160	145	144
101	106	103	175	175	172	162	149	146
102	108	104	176	176	173	164	152	148
103	109	105	176	176	174	166	155	150
104	110	106	177	176	175	167	158	152
105	111	107	178	177	175	169	161	154
106	112	108	178	177	176	170	163	156
107	113	110	179	178	176	171	165	158
108	114	111	179	178	177	172	167	161
109	115	112	180	179	177	173	169	163
110	116	113	181	180	178	174	170	165
111	118	115	182	180	178	174	171	167
112	119	116	183	181	179	175	173	169
113	120	117	183	182	179	176	174	171
114	121	119	185	182	180	177	175	173
115	122	120	185	183	180	177	175	174
116	123	121	187	184	181	178	176	175
117	124	122	188	184	181	178	177	176
118	125	124	189	185	182	180	178	178
119	126	126	190	186	183	180	178	179
120	127	127	191	186	184	181	179	180
121	128	129	192	187	184	182	180	182
122	129	131	193	188	185	183	181	183
123	130	132	193	189	186	183	182	184
124	131	134	194	189	187	184	183	185
125	133	136	195	190	188	185	184	187
126	135	138	195	191	188	186	185	188
127	136	139	195	191	189	187	185	189
128	137	140	195	191	189	187	186	190
129	139	143	196	192	190	188	187	191
130	140	145	196	193	191	189	188	192
131	142	147	196	193	191	190	189	194
132	144	149	197	194	192	191	190	195
133	145	151	197	194	193	191	191	196
134	147	152	197	195	193	192	192	197
135	148	154	198	196	194	193	192	198
136	150	156	198	196	195	193	193	199
137	149	155	197	195	194	192	192	199
138	151	157	197	196	194	193	193	200
139	153	159	198	196	195	194	194	201
140	154	160	198	197	196	194	194	202

Time (min)	Conduit #3 Surface TC No. 340 (°F)	Conduit #3 Surface TC No. 341 (°F)	Conduit #5 Surface TC No. 342 (°F)	Conduit #5 Surface TC No. 343 (°F)	Conduit #5 Surface TC No. 344 (°F)	Conduit #5 Surface TC No. 345 (°F)	Conduit #5 Surface TC No. 346 (°F)	Conduit #5 Surface TC No. 347 (°F)
141	155	162	198	197	196	195	195	203
142	157	163	198	198	197	196	196	204
143	158	165	199	198	197	197	196	205
144	160	166	199	199	198	197	197	207
145	161	166	199	199	199	198	197	208
146	162	168	198	200	199	198	198	209
147	164	168	200	200	200	199	198	210
148	165	169	200	201	200	200	199	211
149	166	170	200	200	200	200	199	212
150	167	171	200	201	201	201	200	213
151	168	171	200	202	201	201	200	214
152	169	172	201	202	202	201	200	215
153	171	172	200	202	202	202	201	216
154	171	173	200	202	202	202	201	217
155	172	174	201	203	202	202	201	218
156	173	173	201	201	202	202	201	219
157	174	173	200	201	203	202	202	220
158	175	174	201	201	203	203	202	221
159	176	174	201	202	203	203	203	221
160	177	175	202	202	204	203	203	222
161	178	176	201	202	204	203	204	224
162	179	177	202	202	204	203	204	225
163	180	177	202	202	204	204	205	226
164	181	178	202	202	204	204	206	227
165	182	178	202	202	205	204	207	228
166	182	180	202	203	205	204	208	230
167	183	180	203	203	204	204	209	231
168	183	181	201	204	205	205	210	232
169	184	181	203	204	205	205	212	233
170	185	182	201	203	206	205	213	234
171	185	183	203	203	205	205	214	236
172	186	183	202	205	206	206	215	237
173	187	185	202	205	207	206	217	238
174	187	184	202	204	208	206	218	239
175	188	185	202	205	208	207	219	240
176	189	187	204	206	209	207	220	241
177	189	187	203	206	209	207	221	243
178	190	188	205	207	209	208	223	244
179	191	189	205	207	209	208	224	245
180	191	190	205	205	210	208	225	246

Time (min)	Conduit #5 Surface TC No. 348 (°F)	Conduit #5 Surface TC No. 349 (°F)	Conduit #5 Surface TC No. 350 (°F)	Conduit #5 Surface TC No. 351 (°F)	Conduit #5 Surface TC No. 352 (°F)	Conduit #5 Surface TC No. 353 (°F)	Conduit #5 Surface TC No. 354 (°F)	Conduit #5 Surface TC No. 355 (°F)
0	63	62	62	62	63	63	63	63
1	63	62	62	63	64	64	63	63
2	63	63	64	64	64	64	64	64
3	64	64	64	64	65	65	64	64
4	63	63	64	64	64	64	64	64
5	63	63	63	63	64	64	64	64
6	63	63	63	63	64	64	64	64
7	63	63	63	64	64	64	64	64
8	64	64	64	64	64	64	64	64
9	64	65	64	64	64	64	64	64
10	66	66	64	64	64	65	64	64
11	68	68	64	64	65	65	64	64
12	70	69	63	63	63	63	63	63
13	70	68	58	59	59	59	58	59
14	75	72	58	59	59	59	59	59
15	86	81	64	65	64	64	64	64
16	91	85	64	65	65	65	64	64
17	97	89	65	66	65	65	64	64
18	102	93	66	67	65	65	64	64
19	107	96	67	69	65	65	64	64
20	110	99	68	70	65	65	64	64
21	113	102	69	71	65	65	64	64
22	115	104	70	73	65	65	64	64
23	117	106	71	76	66	65	64	64
24	119	108	73	79	66	65	64	64
25	120	110	75	81	66	65	64	65
26	121	112	77	85	66	65	64	65
27	122	114	80	91	67	65	65	65
28	123	116	83	97	67	65	64	65
29	124	117	86	102	68	65	64	64
30	124	119	90	107	69	66	65	65
31	125	121	93	112	70	66	65	65
32	126	122	95	116	70	66	65	65
33	126	123	98	119	71	66	65	65
34	126	124	100	123	73	66	65	65
35	126	125	103	126	74	67	65	65
36	126	126	105	129	75	67	65	65
37	126	128	108	132	77	68	66	66
38	125	128	110	134	77	68	66	66
39	125	129	112	136	79	68	66	66
40	125	130	114	138	80	69	66	66
41	126	131	116	140	81	70	67	67
42	126	133	118	142	83	71	68	67
43	127	134	119	144	84	71	68	67
44	128	135	121	145	86	72	69	68
45	129	137	123	147	88	73	69	68
46	130	139	125	148	89	74	70	69

Time (min)	Conduit #5 Surface TC No. 348 (°F)	Conduit #5 Surface TC No. 349 (°F)	Conduit #5 Surface TC No. 350 (°F)	Conduit #5 Surface TC No. 351 (°F)	Conduit #5 Surface TC No. 352 (°F)	Conduit #5 Surface TC No. 353 (°F)	Conduit #5 Surface TC No. 354 (°F)	Conduit #5 Surface TC No. 355 (°F)
47	131	140	127	150	91	76	71	70
48	133	142	128	151	93	77	72	70
49	134	143	130	152	95	79	73	71
50	135	144	132	153	98	80	74	72
51	136	145	133	155	100	81	75	73
52	137	146	134	156	102	83	76	73
53	138	148	136	157	104	84	77	74
54	139	149	137	158	106	86	78	75
55	140	150	138	159	108	88	79	76
56	141	151	139	160	110	89	80	77
57	142	152	140	161	112	91	82	78
58	143	154	141	162	114	93	83	79
59	144	156	142	163	115	94	84	80
60	145	157	144	164	117	96	86	82
61	146	159	145	165	119	97	87	83
62	146	161	146	166	120	98	89	84
63	148	163	148	167	122	100	90	85
64	148	165	149	167	124	102	92	86
65	149	167	151	167	125	103	93	88
66	150	168	153	168	127	105	95	89
67	151	169	154	168	129	106	97	90
68	151	170	156	169	130	108	98	91
69	152	171	158	170	132	110	100	93
70	153	172	159	171	133	111	101	94
71	153	173	161	172	134	113	103	96
72	154	174	162	173	136	115	105	97
73	155	175	163	174	137	116	106	98
74	155	176	165	175	139	118	108	100
75	156	177	166	176	140	119	109	101
76	157	178	167	177	141	120	111	103
77	157	178	169	178	142	121	112	104
78	158	179	170	179	143	123	114	106
79	159	179	171	180	145	124	115	107
80	159	180	172	181	146	125	116	108
81	160	181	173	182	147	126	118	110
82	161	182	175	183	148	128	119	111
83	161	184	176	184	149	129	120	112
84	162	185	176	185	150	130	121	113
85	163	186	177	185	151	131	122	115
86	163	186	178	186	152	132	123	116
87	164	187	179	187	153	133	124	117
88	165	188	180	187	154	134	125	118
89	166	190	181	188	155	135	126	119
90	166	192	182	189	156	137	127	120
91	167	193	183	189	157	138	129	121
92	168	193	183	190	158	139	129	122
93	169	194	184	190	159	140	130	123

Time (min)	Conduit #5 Surface TC No. 348 (°F)	Conduit #5 Surface TC No. 349 (°F)	Conduit #5 Surface TC No. 350 (°F)	Conduit #5 Surface TC No. 351 (°F)	Conduit #5 Surface TC No. 352 (°F)	Conduit #5 Surface TC No. 353 (°F)	Conduit #5 Surface TC No. 354 (°F)	Conduit #5 Surface TC No. 355 (°F)
94	170	195	185	191	160	141	131	124
95	171	196	185	192	161	142	133	125
96	171	197	186	192	162	143	134	126
97	172	198	187	193	163	144	134	127
98	173	199	188	193	163	145	136	128
99	175	200	189	194	165	146	137	129
100	176	200	189	195	165	147	138	130
101	177	201	190	196	166	148	139	131
102	178	202	191	196	167	150	140	132
103	179	203	192	197	168	151	142	133
104	180	204	193	198	169	152	143	134
105	182	205	194	198	170	153	144	135
106	183	205	195	199	170	154	145	136
107	184	206	196	200	172	155	146	138
108	186	207	197	201	172	156	147	138
109	187	208	198	201	173	157	148	140
110	189	209	199	202	174	158	149	141
111	190	210	199	203	175	159	150	142
112	192	211	201	204	176	161	152	143
113	194	212	201	204	177	161	152	144
114	195	213	202	205	178	163	154	145
115	196	213	202	205	178	163	154	146
116	198	214	203	206	179	164	155	147
117	200	215	203	206	180	165	156	147
118	202	216	204	207	181	167	157	149
119	203	216	204	208	181	167	158	149
120	205	218	205	209	183	168	159	150
121	206	219	205	210	184	169	160	151
122	207	220	205	210	184	170	161	152
123	209	222	206	212	186	172	162	154
124	211	223	207	213	187	173	163	155
125	213	225	207	214	188	174	165	157
126	214	226	208	214	189	175	166	158
127	215	227	208	215	189	176	167	159
128	216	228	208	215	190	177	167	160
129	218	230	209	217	192	178	169	161
130	220	231	209	218	193	179	170	162
131	221	232	209	219	194	180	171	163
132	222	233	210	219	194	181	172	165
133	224	234	210	220	195	183	173	166
134	225	235	211	221	196	183	174	167
135	227	237	212	222	197	185	176	169
136	228	238	212	222	198	185	177	170
137	227	237	211	221	197	185	176	169
138	229	238	211	222	198	186	177	171
139	230	239	212	223	199	187	178	172
140	231	240	212	224	200	188	179	173

Time (min)	Conduit #5 Surface TC No. 348 (°F)	Conduit #5 Surface TC No. 349 (°F)	Conduit #5 Surface TC No. 350 (°F)	Conduit #5 Surface TC No. 351 (°F)	Conduit #5 Surface TC No. 352 (°F)	Conduit #5 Surface TC No. 353 (°F)	Conduit #5 Surface TC No. 354 (°F)	Conduit #5 Surface TC No. 355 (°F)
141	233	242	213	225	201	189	181	174
142	234	243	214	226	202	190	182	176
143	235	244	214	227	203	191	183	177
144	237	245	215	227	205	193	184	178
145	238	246	216	228	206	194	185	179
146	239	247	216	229	207	195	187	181
147	241	248	217	230	208	196	188	182
148	242	249	218	231	210	197	189	183
149	243	250	218	232	211	199	190	184
150	245	252	219	233	212	200	191	185
151	246	253	220	233	214	201	193	186
152	247	254	220	234	215	203	194	188
153	248	255	221	235	216	204	195	189
154	249	256	222	236	218	206	197	190
155	251	257	223	237	219	207	198	192
156	251	258	223	238	220	208	199	193
157	253	259	224	239	222	210	201	195
158	254	260	224	240	223	211	203	196
159	255	261	225	241	224	213	204	198
160	256	263	226	242	226	214	206	200
161	258	264	227	243	228	216	208	201
162	259	265	228	244	229	218	210	203
163	260	267	229	246	231	219	212	205
164	261	268	230	247	232	221	214	207
165	262	269	232	248	233	222	215	208
166	263	270	233	250	235	224	217	210
167	265	271	234	251	237	226	219	212
168	266	272	235	252	238	227	220	213
169	267	273	236	253	239	229	222	215
170	268	275	237	255	241	230	224	217
171	269	276	238	256	242	232	226	218
172	270	277	239	257	244	233	227	220
173	272	278	241	259	246	235	229	222
174	273	279	242	260	247	237	231	223
175	274	281	243	262	248	238	233	225
176	275	282	244	263	250	240	234	227
177	276	283	246	264	251	242	236	228
178	277	285	247	266	253	243	238	230
179	279	286	248	267	254	245	239	232
180	280	287	249	268	256	246	241	233

Time (min)	Conduit #5 Surface TC No. 356 (°F)	Conduit #5 Surface TC No. 357 (°F)	Conduit #5 Surface TC No. 358 (°F)	Conduit #5 Surface TC No. 359 (°F)	Conduit #5 Surface TC No. 360 (°F)	Conduit #5 Surface TC No. 361 (°F)	Conduit #5 Surface TC No. 362 (°F)	Conduit #5 Surface TC No. 363 (°F)
0	64	63	64	64	64	65	65	65
1	64	63	64	64	64	65	65	65
2	65	64	65	65	65	66	66	66
3	65	64	65	65	65	66	66	66
4	65	64	65	65	65	65	66	66
5	64	64	64	65	65	65	65	66
6	64	64	64	65	64	65	65	66
7	65	64	64	65	64	65	65	66
8	65	64	64	65	65	65	65	66
9	65	64	64	65	65	65	66	66
10	65	64	65	65	65	66	66	66
11	65	64	65	65	65	66	66	66
12	64	63	63	64	64	65	65	65
13	59	59	59	60	60	60	60	61
14	59	59	59	60	60	61	61	61
15	65	64	65	65	65	65	66	66
16	65	64	65	65	65	66	66	66
17	65	64	65	65	65	66	66	66
18	65	64	65	65	65	66	66	66
19	65	64	65	65	65	66	66	67
20	65	64	65	65	65	66	66	67
21	65	64	65	65	65	66	66	67
22	65	64	65	65	65	66	66	67
23	65	64	65	65	65	66	66	68
24	65	64	65	65	65	66	66	68
25	65	64	65	65	65	66	66	68
26	65	64	65	65	65	66	66	69
27	65	65	65	65	65	66	67	69
28	65	64	65	65	65	66	67	69
29	65	64	65	65	65	66	67	69
30	66	65	65	65	65	66	67	70
31	66	65	65	65	65	66	67	70
32	66	65	65	65	65	66	67	70
33	66	65	65	65	65	66	67	71
34	66	65	65	65	65	66	67	71
35	66	65	65	65	65	67	67	71
36	66	65	65	66	66	67	67	72
37	67	66	66	66	66	67	68	72
38	67	65	66	66	66	67	68	72
39	67	65	66	66	66	67	68	72
40	67	66	66	66	66	67	68	73
41	67	66	66	66	66	67	69	73
42	68	66	66	66	66	68	69	74
43	68	66	66	66	66	68	69	74
44	69	66	66	66	66	68	69	74
45	69	67	67	66	67	68	70	75
46	69	67	67	67	67	68	70	75

Time (min)	Conduit #5 Surface TC No. 356 (°F)	Conduit #5 Surface TC No. 357 (°F)	Conduit #5 Surface TC No. 358 (°F)	Conduit #5 Surface TC No. 359 (°F)	Conduit #5 Surface TC No. 360 (°F)	Conduit #5 Surface TC No. 361 (°F)	Conduit #5 Surface TC No. 362 (°F)	Conduit #5 Surface TC No. 363 (°F)
47	70	67	67	67	67	69	70	76
48	71	68	67	67	67	69	71	77
49	71	68	68	67	68	69	71	77
50	72	69	68	68	68	70	72	78
51	73	70	69	68	68	70	72	79
52	73	70	69	69	68	70	72	79
53	74	71	70	69	69	71	73	80
54	75	71	70	69	69	71	74	81
55	76	72	71	70	70	72	74	81
56	77	73	71	70	70	72	75	82
57	78	73	72	71	71	73	75	83
58	79	74	73	72	71	73	76	84
59	80	75	73	72	72	74	76	84
60	81	76	74	73	72	74	77	85
61	81	77	75	73	73	75	78	86
62	83	78	75	74	73	76	79	86
63	84	79	76	75	74	76	80	87
64	85	80	77	75	75	77	80	88
65	86	80	78	76	75	78	81	89
66	87	81	79	77	76	79	82	89
67	88	82	80	78	77	80	83	90
68	89	83	80	78	78	80	83	91
69	90	84	81	79	79	81	84	92
70	91	85	82	80	79	82	85	93
71	92	86	83	81	80	83	86	94
72	94	87	84	82	81	84	87	95
73	95	88	85	82	82	84	88	95
74	96	89	86	83	83	85	89	96
75	97	90	87	84	84	86	89	97
76	99	92	88	85	85	87	90	98
77	100	93	89	86	86	88	91	99
78	101	94	90	87	87	89	92	100
79	102	95	91	88	88	90	93	101
80	104	96	92	89	89	91	94	102
81	105	97	93	90	90	92	95	103
82	106	98	94	91	91	93	96	104
83	108	99	96	92	92	94	97	105
84	109	100	96	93	93	95	98	105
85	110	101	98	94	94	96	99	106
86	111	102	98	96	95	97	100	107
87	112	103	99	97	96	98	101	108
88	113	104	101	98	97	98	101	109
89	115	106	102	99	98	99	102	110
90	116	107	103	100	99	101	103	111
91	117	108	104	101	100	101	104	112
92	118	109	105	102	101	102	105	112
93	119	110	106	103	102	103	106	113

Time (min)	Conduit #5 Surface TC No. 356 (°F)	Conduit #5 Surface TC No. 357 (°F)	Conduit #5 Surface TC No. 358 (°F)	Conduit #5 Surface TC No. 359 (°F)	Conduit #5 Surface TC No. 360 (°F)	Conduit #5 Surface TC No. 361 (°F)	Conduit #5 Surface TC No. 362 (°F)	Conduit #5 Surface TC No. 363 (°F)
94	120	111	107	103	102	104	107	114
95	121	112	108	105	104	105	108	115
96	123	113	109	106	105	106	109	116
97	123	114	110	107	106	107	110	117
98	125	115	111	108	107	108	111	117
99	126	117	112	109	108	109	112	119
100	127	118	113	110	109	110	113	119
101	128	119	115	111	110	111	114	120
102	129	120	116	112	111	112	115	121
103	130	121	117	113	112	113	116	123
104	132	122	118	114	113	114	117	123
105	133	124	119	115	114	115	118	124
106	134	125	121	116	115	116	119	125
107	135	126	122	118	116	117	120	126
108	136	127	123	119	117	118	121	128
109	137	129	124	120	119	120	122	129
110	138	130	126	121	120	121	123	130
111	139	131	127	123	121	122	125	131
112	141	132	128	124	122	123	126	133
113	142	134	130	125	124	124	127	134
114	143	135	131	126	125	126	128	136
115	143	135	132	127	125	126	129	137
116	145	137	133	128	127	128	130	138
117	145	137	134	129	127	128	131	139
118	146	139	135	131	129	130	133	141
119	147	139	136	131	130	131	134	143
120	148	141	137	133	131	132	135	144
121	149	142	138	134	132	133	136	146
122	150	143	139	135	133	134	137	148
123	151	144	141	137	135	136	139	150
124	152	145	142	138	136	137	140	153
125	154	147	144	139	137	139	142	155
126	155	148	145	141	138	140	143	157
127	156	149	145	141	139	141	144	158
128	157	149	146	142	140	142	145	159
129	158	151	148	144	142	144	147	161
130	160	153	150	145	143	145	148	163
131	161	154	151	146	145	146	150	165
132	162	155	152	148	146	148	151	166
133	163	156	153	149	147	149	152	168
134	164	157	154	150	149	150	153	169
135	166	159	156	152	150	152	155	170
136	167	160	157	153	151	153	156	171
137	166	159	156	153	151	153	156	171
138	167	161	158	154	152	154	157	172
139	169	162	159	155	153	155	158	173
140	170	163	160	157	155	157	160	174

OMEGA POINT LABORATORIES

Time (min)	Conduit #5 Surface TC No. 356 (°F)	Conduit #5 Surface TC No. 357 (°F)	Conduit #5 Surface TC No. 358 (°F)	Conduit #5 Surface TC No. 359 (°F)	Conduit #5 Surface TC No. 360 (°F)	Conduit #5 Surface TC No. 361 (°F)	Conduit #5 Surface TC No. 362 (°F)	Conduit #5 Surface TC No. 363 (°F)
141	171	164	162	158	156	158	161	175
142	172	166	163	159	158	160	162	176
143	174	167	164	161	159	161	164	177
144	175	169	166	162	160	162	165	178
145	176	170	167	163	162	164	166	179
146	177	171	168	165	163	165	168	180
147	179	172	170	166	164	167	169	180
148	180	174	171	167	166	168	170	181
149	181	175	172	169	167	169	171	181
150	182	176	173	170	168	170	172	182
151	183	177	175	171	170	172	174	183
152	184	178	176	173	171	173	175	184
153	186	179	177	174	172	174	176	184
154	187	181	178	175	174	175	177	185
155	188	182	180	176	175	176	178	186
156	189	183	180	177	176	177	179	187
157	190	184	182	178	177	178	180	187
158	191	185	183	179	178	179	181	188
159	193	187	184	180	179	180	182	188
160	194	188	186	182	180	182	183	189
161	196	189	187	183	181	183	184	189
162	197	191	188	184	183	184	185	190
163	198	192	189	185	184	185	186	190
164	200	193	191	186	185	186	187	191
165	201	194	192	187	186	187	188	191
166	202	196	194	188	187	188	189	191
167	204	197	195	189	188	189	189	192
168	205	198	196	190	189	190	190	192
169	206	200	198	191	190	191	191	193
170	207	201	199	192	190	192	192	193
171	208	202	201	194	191	193	193	193
172	209	204	202	195	192	193	193	193
173	211	205	204	196	193	194	194	194
174	212	206	206	198	194	195	194	195
175	213	208	207	200	195	196	195	195
176	214	209	208	201	196	197	196	195
177	215	210	210	203	197	197	196	196
178	216	212	211	204	198	198	197	197
179	218	213	213	206	199	199	197	197
180	219	215	214	207	199	199	198	197

OMEGA POINT LABORATORIES

Time (min)	Conduit #10 Surface TC No. 364 (°F)	Conduit #10 Surface TC No. 365 (°F)	Conduit #10 Surface TC No. 366 (°F)	Conduit #10 Surface TC No. 367 (°F)	Conduit #10 Surface TC No. 368 (°F)	Conduit #10 Surface TC No. 369 (°F)	Conduit #10 Surface TC No. 370 (°F)
0	69	68	67	68	67	67	71
1	69	68	67	67	67	67	71
2	66	65	65	65	64	65	68
3	66	65	65	65	64	65	69
4	66	65	65	65	64	65	68
5	66	65	65	65	64	65	68
6	66	65	65	65	64	64	68
7	66	65	64	65	64	64	68
8	66	65	64	65	64	64	68
9	66	65	65	65	64	65	68
10	66	66	65	65	64	65	69
11	66	66	65	65	64	65	69
12	71	70	69	69	68	69	73
13	89	88	88	88	87	88	94
14	89	88	87	88	87	89	100
15	68	67	65	65	64	69	94
16	68	67	65	65	64	73	114
17	68	67	65	65	65	80	129
18	69	68	65	65	66	87	138
19	70	69	65	65	66	94	143
20	70	69	65	66	68	99	145
21	71	70	65	66	69	104	147
22	72	71	66	66	70	108	150
23	73	72	66	66	72	111	151
24	74	73	66	67	73	113	151
25	75	74	66	67	75	115	151
26	77	75	67	68	76	116	150
27	78	76	67	68	77	117	148
28	79	77	67	68	78	116	146
29	80	78	67	69	79	116	144
30	81	79	68	70	80	116	143
31	83	81	68	70	81	115	141
32	84	82	69	71	81	114	140
33	85	84	69	71	82	114	138
34	87	87	70	72	83	113	137
35	90	89	71	72	84	113	137
36	92	92	71	73	85	113	136
37	96	96	73	74	86	113	136
38	99	99	74	75	87	113	135
39	102	103	75	76	88	113	135
40	106	107	77	77	88	113	135
41	111	110	79	78	89	113	135
42	115	114	81	79	90	114	135
43	119	118	83	80	91	114	136
44	124	122	86	81	92	115	137
45	129	127	88	83	93	116	138
46	134	132	92	85	94	116	139

OMEGA POINT LABORATORIES

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Time (min)	Conduit #10 Surface TC No. 364 (°F)	Conduit #10 Surface TC No. 365 (°F)	Conduit #10 Surface TC No. 366 (°F)	Conduit #10 Surface TC No. 367 (°F)	Conduit #10 Surface TC No. 368 (°F)	Conduit #10 Surface TC No. 369 (°F)	Conduit #10 Surface TC No. 370 (°F)
47	139	137	95	86	95	118	140
48	144	143	99	88	97	119	141
49	148	148	103	91	98	120	143
50	152	154	108	93	100	122	145
51	156	158	113	96	102	124	147
52	160	163	119	99	103	125	148
53	162	168	124	102	106	127	150
54	165	171	131	106	108	129	152
55	167	175	137	110	110	131	154
56	170	178	143	115	112	133	155
57	171	181	150	120	115	135	157
58	173	183	156	125	118	137	158
59	174	186	162	130	121	139	160
60	176	187	167	135	125	141	161
61	177	188	172	141	129	143	162
62	178	189	177	147	134	145	163
63	179	190	181	152	139	147	165
64	180	191	184	158	145	150	166
65	180	193	186	164	151	152	167
66	181	193	188	169	157	155	168
67	182	194	190	174	163	159	170
68	182	194	191	179	169	162	171
69	183	195	192	184	175	167	173
70	183	196	193	187	180	172	175
71	184	197	195	190	184	177	178
72	185	198	196	192	187	181	181
73	186	199	197	194	190	185	185
74	187	200	197	195	192	188	189
75	188	200	198	196	194	191	192
76	189	201	199	197	195	193	195
77	190	202	200	198	196	194	196
78	191	203	201	199	197	196	198
79	192	204	203	201	198	197	199
80	194	205	204	202	200	198	201
81	196	206	205	204	201	200	202
82	197	207	206	205	202	201	203
83	200	208	207	206	203	202	204
84	203	208	207	206	204	203	205
85	207	209	208	207	204	204	206
86	209	209	208	207	205	205	207
87	210	209	208	208	206	206	207
88	210	209	208	208	206	206	208
89	210	209	208	208	206	207	209
90	210	209	208	208	206	207	210
91	210	209	209	208	207	207	210
92	210	209	209	208	207	207	211
93	210	209	209	209	207	208	211

OMEGA POINT LABORATORIES

Time (min)	Conduit #10 Surface TC No. 364 (°F)	Conduit #10 Surface TC No. 365 (°F)	Conduit #10 Surface TC No. 366 (°F)	Conduit #10 Surface TC No. 367 (°F)	Conduit #10 Surface TC No. 368 (°F)	Conduit #10 Surface TC No. 369 (°F)	Conduit #10 Surface TC No. 370 (°F)
94	211	209	209	208	207	208	211
95	211	209	209	208	207	208	211
96	211	209	209	209	207	208	211
97	211	209	209	209	207	208	211
98	211	210	209	209	208	208	211
99	211	210	209	209	208	208	212
100	211	210	209	209	208	208	212
101	212	210	209	209	208	208	212
102	212	210	209	209	208	209	212
103	212	211	209	209	208	209	213
104	213	211	209	209	208	209	213
105	214	211	209	209	208	209	213
106	216	212	209	209	208	209	213
107	218	212	210	210	208	209	213
108	219	212	209	209	208	209	213
109	221	213	210	210	209	209	213
110	223	215	210	210	209	210	214
111	225	217	210	210	209	210	214
112	228	218	210	211	210	210	214
113	230	219	210	210	209	210	214
114	233	220	211	211	210	211	215
115	235	221	210	210	209	210	214
116	238	222	211	211	210	211	215
117	240	223	210	211	209	210	214
118	243	225	211	211	210	211	215
119	245	226	211	211	210	211	214
120	248	228	211	211	210	211	215
121	251	230	211	211	210	211	215
122	254	231	211	211	210	211	215
123	257	233	212	212	211	211	215
124	260	235	212	212	211	212	216
125	264	237	212	212	211	212	216
126	266	239	212	212	211	212	216
127	269	241	212	212	211	212	216
128	272	242	212	212	211	212	215
129	276	245	213	213	212	213	216
130	279	247	213	213	212	213	216
131	282	249	213	213	212	213	216
132	285	251	213	213	212	213	216
133	288	253	213	213	212	213	216
134	291	256	213	213	212	213	217
135	294	258	213	213	212	213	217
136	297	260	213	213	212	213	217
137	298	261	211	211	210	211	215
138	301	263	211	211	210	211	215
139	304	265	211	211	210	211	215
140	307	268	212	211	210	211	216

OMEGA POINT LABORATORIES

Time (min)	Conduit #10 Surface TC No. 364 (°F)	Conduit #10 Surface TC No. 365 (°F)	Conduit #10 Surface TC No. 366 (°F)	Conduit #10 Surface TC No. 367 (°F)	Conduit #10 Surface TC No. 368 (°F)	Conduit #10 Surface TC No. 369 (°F)	Conduit #10 Surface TC No. 370 (°F)
141	310	270	212	211	210	211	216
142	313	273	213	211	211	211	216
143	316	275	213	211	211	211	216
144	319	278	214	211	212	212	217
145	322	280	217	211	214	212	217
146	325	283	219	211	216	213	218
147	327	285	220	212	217	214	219
148	330	288	221	213	219	216	221
149	333	290	222	214	220	217	222
150	336	293	223	217	222	219	224
151	338	296	224	218	223	221	227
152	341	298	226	219	225	223	229
153	344	301	228	221	226	225	231
154	346	304	230	223	228	227	233
155	349	307	232	225	230	230	235
156	351	309	234	226	231	232	237
157	353	312	236	229	233	234	240
158	356	314	239	231	235	236	242
159	359	317	241	233	237	239	245
160	361	320	244	235	240	241	247
161	364	323	246	238	242	244	250
162	367	326	249	241	245	247	253
163	369	329	252	243	247	249	256
164	372	332	255	245	249	252	259
165	374	335	258	248	252	255	262
166	377	338	261	251	254	258	265
167	380	341	264	253	257	260	268
168	382	344	267	256	259	263	271
169	384	347	270	258	262	266	274
170	387	350	273	261	265	269	277
171	389	353	276	264	268	272	280
172	391	356	280	267	270	274	283
173	394	359	283	270	273	278	286
174	396	361	286	272	276	280	289
175	398	364	289	275	278	283	292
176	400	366	292	278	281	286	295
177	403	369	295	281	284	289	298
178	405	371	298	284	287	292	301
179	407	374	301	287	289	295	305
180	409	377	304	290	292	298	308

Time (min)	Conduit #10 Surface TC No. 371 (°F)	Conduit #10 Surface TC No. 372 (°F)	Conduit #9 Surface TC No. 373 (°F)	Conduit #9 Surface TC No. 374 (°F)	Conduit #9 Surface TC No. 375 (°F)	Conduit #9 Surface TC No. 376 (°F)	Conduit #9 Surface TC No. 377 (°F)
0	70	69	68	67	68	67	67
1	70	69	67	67	67	67	67
2	67	66	67	67	68	67	67
3	67	66	68	67	68	67	67
4	67	66	68	67	68	67	67
5	67	65	68	67	68	67	67
6	67	65	68	67	68	67	67
7	67	65	68	67	68	67	67
8	67	65	68	67	68	67	67
9	67	66	68	67	68	67	67
10	67	66	68	67	68	67	67
11	68	66	68	67	68	67	67
12	85	72	68	67	68	67	67
13	142	100	68	67	68	67	67
14	168	113	68	67	68	67	67
15	161	103	68	67	68	67	67
16	170	113	68	67	68	67	67
17	174	120	68	67	68	67	67
18	176	123	68	67	68	67	67
19	176	124	68	67	68	67	67
20	175	124	68	67	68	67	67
21	175	124	68	67	68	67	67
22	175	124	69	67	68	67	67
23	175	125	69	67	68	67	67
24	176	127	69	67	68	67	67
25	177	133	69	68	68	67	67
26	179	142	70	68	68	67	67
27	179	156	70	68	68	67	67
28	177	167	71	68	68	67	67
29	174	172	72	68	68	67	67
30	172	175	73	69	68	67	67
31	169	177	74	69	69	67	67
32	167	177	75	69	69	67	67
33	166	177	76	70	69	67	67
34	165	178	77	70	69	68	68
35	164	178	79	71	70	68	68
36	164	178	80	72	70	68	68
37	165	178	82	72	71	68	68
38	165	178	83	73	71	69	68
39	166	179	85	74	72	69	68
40	166	179	86	75	72	69	68
41	167	180	88	76	73	70	68
42	168	180	90	77	73	70	69
43	169	180	91	78	74	71	69
44	170	181	93	79	75	71	69
45	171	182	95	80	76	72	70
46	173	183	96	81	77	72	70

OMEGA POINT LABORATORIES

Time (min)	Conduit #10 Surface TC No. 371 (°F)	Conduit #10 Surface TC No. 372 (°F)	Conduit #9 Surface TC No. 373 (°F)	Conduit #9 Surface TC No. 374 (°F)	Conduit #9 Surface TC No. 375 (°F)	Conduit #9 Surface TC No. 376 (°F)	Conduit #9 Surface TC No. 377 (°F)
47	174	184	98	83	78	73	71
48	175	185	100	84	79	74	71
49	177	186	101	85	80	75	72
50	178	187	102	87	81	76	72
51	179	188	104	88	82	76	73
52	180	188	105	89	83	78	74
53	181	189	106	90	85	78	75
54	182	190	107	92	86	79	76
55	182	190	109	93	87	80	76
56	183	191	110	94	89	82	78
57	184	191	111	95	89	83	78
58	184	191	112	96	90	83	79
59	185	192	113	98	91	84	80
60	185	192	114	99	92	85	81
61	186	192	115	100	93	86	81
62	186	192	116	101	94	87	82
63	187	193	117	102	95	88	83
64	188	193	118	103	96	89	84
65	188	193	119	104	97	90	85
66	188	193	119	105	98	91	86
67	189	194	121	107	100	92	87
68	189	194	122	108	101	94	89
69	190	195	123	109	102	95	90
70	191	195	124	110	103	96	91
71	191	195	125	111	104	97	92
72	192	196	127	113	106	99	94
73	193	197	128	114	107	100	95
74	194	198	130	116	109	102	96
75	195	198	131	117	110	103	98
76	197	199	133	119	112	105	100
77	198	200	134	120	113	106	101
78	199	202	136	121	115	108	103
79	200	203	137	123	117	110	105
80	202	204	139	125	119	112	107
81	203	205	141	127	121	114	109
82	204	206	142	129	123	116	111
83	205	206	144	130	124	118	113
84	205	207	145	132	126	120	115
85	206	208	147	133	128	121	117
86	207	208	148	135	130	123	119
87	208	208	150	137	132	126	121
88	208	208	152	139	134	128	123
89	209	209	154	140	136	130	126
90	210	209	155	142	137	132	128
91	210	209	157	144	139	134	130
92	211	210	158	145	141	135	132
93	211	210	160	147	143	137	134

OMEGA POINT LABORATORIES

Time (min)	Conduit #10 Surface TC No. 371 (°F)	Conduit #10 Surface TC No. 372 (°F)	Conduit #9 Surface TC No. 373 (°F)	Conduit #9 Surface TC No. 374 (°F)	Conduit #9 Surface TC No. 375 (°F)	Conduit #9 Surface TC No. 376 (°F)	Conduit #9 Surface TC No. 377 (°F)
94	212	210	162	149	144	139	136
95	212	210	164	150	146	141	138
96	213	210	165	152	148	143	140
97	213	210	168	154	149	144	142
98	214	210	170	155	151	146	144
99	214	210	172	157	152	148	146
100	215	210	174	158	154	150	147
101	215	210	176	160	156	152	149
102	216	211	178	161	157	153	151
103	217	211	179	163	159	155	153
104	217	211	181	165	160	156	155
105	218	211	183	166	162	158	157
106	218	211	184	168	163	159	158
107	219	211	186	169	164	161	159
108	220	211	187	171	166	163	161
109	221	211	189	172	168	164	163
110	222	211	190	173	169	166	164
111	222	211	191	174	170	167	165
112	224	212	193	176	171	168	167
113	224	212	195	178	173	170	169
114	225	212	195	178	174	171	170
115	226	212	197	180	175	172	171
116	227	213	198	181	176	173	173
117	227	213	199	182	177	175	174
118	229	213	200	184	179	176	175
119	229	214	201	185	180	177	177
120	231	215	202	186	181	179	178
121	232	216	203	187	182	179	179
122	233	216	205	190	184	182	181
123	235	217	203	188	183	180	180
124	236	218	200	186	180	178	177
125	238	220	200	187	181	179	178
126	239	221	199	188	181	179	179
127	240	222	200	189	182	180	180
128	241	222	200	190	184	182	181
129	243	225	201	192	186	184	183
130	244	226	202	193	187	185	185
131	246	227	202	194	188	187	186
132	247	228	203	195	190	188	188
133	249	229	205	196	191	190	189
134	251	231	207	198	193	192	191
135	253	215	208	199	195	193	193
136	229	214	209	200	196	195	194
137	214	212	210	199	196	195	195
138	213	212	212	200	197	196	196
139	213	211	213	201	198	197	197
140	213	211	215	202	199	198	198

Time (min)	Conduit #10 Surface TC No. 371 (°F)	Conduit #10 Surface TC No. 372 (°F)	Conduit #9 Surface TC No. 373 (°F)	Conduit #9 Surface TC No. 374 (°F)	Conduit #9 Surface TC No. 375 (°F)	Conduit #9 Surface TC No. 376 (°F)	Conduit #9 Surface TC No. 377 (°F)
141	213	211	217	202	200	199	199
142	214	211	218	203	201	200	200
143	224	211	219	204	202	201	201
144	232	211	220	204	203	202	202
145	238	211	222	205	204	203	203
146	243	211	223	206	205	204	204
147	247	211	225	207	206	204	204
148	252	217	226	208	207	205	205
149	256	224	228	209	208	205	205
150	260	229	230	210	209	206	206
151	263	234	231	211	210	206	206
152	267	237	233	212	211	207	207
153	271	241	235	213	212	208	207
154	274	244	237	214	214	209	208
155	277	247	239	215	215	210	209
156	280	250	244	219	219	214	212
157	283	253	246	220	220	215	213
158	287	255	247	221	221	216	214
159	290	258	249	222	222	217	215
160	293	261	251	222	223	218	215
161	297	264	253	223	224	218	215
162	300	267	253	222	223	217	215
163	304	271	255	223	224	218	216
164	307	274	257	224	225	220	217
165	310	277	259	225	227	221	218
166	313	280	262	227	228	222	220
167	316	283	264	228	229	223	221
168	320	286	266	229	231	225	222
169	323	289	268	231	232	226	223
170	326	292	270	233	234	227	225
171	329	295	272	235	235	229	226
172	332	298	275	238	237	230	227
173	335	301	277	241	238	232	229
174	338	305	279	244	240	233	230
175	341	308	281	246	242	234	231
176	344	311	283	248	243	236	232
177	347	314	286	250	245	237	234
178	350	317	288	253	247	239	235
179	353	319	290	255	249	240	237
180	356	322	292	258	250	242	238

Time (min)	Conduit #9 Surface TC No. 378 (°F)	Conduit #9 Surface TC No. 379 (°F)	Conduit #9 Surface TC No. 380 (°F)	Conduit #9 Surface TC No. 381 (°F)	Conduit #11 Surface TC No. 382 (°F)	Conduit #11 Surface TC No. 383 (°F)	Conduit #11 Surface TC No. 384 (°F)
0	68	67	67	66	68	69	68
1	68	67	67	66	68	68	68
2	68	67	67	66	65	66	65
3	68	67	67	66	65	66	65
4	68	67	67	66	65	66	65
5	68	67	67	66	65	65	65
6	68	67	67	66	65	66	65
7	68	67	67	66	65	66	65
8	68	67	67	66	65	66	65
9	68	67	67	66	65	66	65
10	67	67	67	66	66	67	65
11	68	67	67	66	67	68	65
12	68	67	67	66	74	75	69
13	68	67	67	66	98	101	91
14	68	67	67	66	102	105	91
15	67	67	67	66	83	86	68
16	68	67	67	66	87	90	69
17	68	67	67	66	90	93	70
18	68	67	67	66	93	96	71
19	68	67	67	66	96	99	73
20	68	67	67	66	99	101	75
21	68	67	67	66	101	103	78
22	68	67	67	66	104	106	81
23	68	67	67	66	106	108	84
24	68	67	67	66	109	110	88
25	68	67	67	66	112	113	92
26	68	67	67	66	115	116	96
27	68	67	68	66	118	119	101
28	68	67	68	66	122	123	106
29	68	67	68	66	126	127	111
30	68	67	68	66	132	132	117
31	68	67	68	67	138	137	122
32	68	67	68	67	144	141	127
33	68	67	68	67	150	146	132
34	68	67	68	67	157	151	137
35	68	67	68	67	165	156	143
36	68	67	68	67	173	162	149
37	68	67	68	67	180	169	156
38	68	67	69	67	184	175	163
39	68	67	69	67	189	181	172
40	68	68	69	67	193	187	179
41	68	68	69	67	196	192	186
42	68	68	69	67	200	197	192
43	69	68	69	67	202	201	198
44	69	68	70	68	204	204	203
45	69	68	70	68	206	206	206
46	69	68	70	68	207	207	207

OMEGA POINT LABORATORIES

Time (min)	Conduit #9 Surface TC No. 378 (°F)	Conduit #9 Surface TC No. 379 (°F)	Conduit #9 Surface TC No. 380 (°F)	Conduit #9 Surface TC No. 381 (°F)	Conduit #11 Surface TC No. 382 (°F)	Conduit #11 Surface TC No. 383 (°F)	Conduit #11 Surface TC No. 384 (°F)
47	70	69	71	68	207	208	207
48	70	69	71	69	207	209	208
49	70	69	71	69	208	209	208
50	71	70	72	69	208	209	208
51	72	70	72	70	208	209	208
52	72	71	73	70	208	209	208
53	73	71	73	71	208	209	208
54	73	72	74	71	208	209	208
55	74	72	74	71	208	209	208
56	75	73	75	72	208	209	208
57	76	74	76	73	208	209	208
58	76	74	76	73	208	209	208
59	77	75	77	74	208	209	208
60	78	76	78	75	208	209	208
61	79	76	79	75	209	210	208
62	79	77	80	76	212	210	209
63	80	78	81	77	213	210	209
64	81	79	82	78	215	211	210
65	82	80	83	79	217	214	211
66	83	81	84	80	220	215	213
67	84	82	85	81	224	217	215
68	85	83	86	82	227	219	217
69	86	84	87	83	230	222	219
70	87	85	89	84	233	225	221
71	88	86	90	85	236	227	224
72	90	88	91	87	240	230	227
73	91	89	92	88	243	233	230
74	93	90	94	89	247	237	233
75	94	92	95	90	251	240	236
76	96	94	96	92	254	244	239
77	97	95	98	93	258	247	242
78	99	96	99	95	263	251	246
79	101	99	101	97	267	255	249
80	103	101	103	99	271	259	253
81	105	103	105	101	275	263	257
82	107	105	106	103	279	267	260
83	109	106	108	104	284	271	264
84	111	108	110	106	288	274	267
85	113	110	112	108	292	278	271
86	115	112	114	110	296	282	275
87	117	115	116	112	301	286	278
88	120	117	119	115	305	290	282
89	122	120	121	117	309	295	285
90	124	122	123	119	313	299	289
91	127	124	125	121	317	303	292
92	129	126	127	123	322	307	296
93	131	128	129	126	326	311	300

Time (min)	Conduit #9 Surface TC No. 378 (°F)	Conduit #9 Surface TC No. 379 (°F)	Conduit #9 Surface TC No. 380 (°F)	Conduit #9 Surface TC No. 381 (°F)	Conduit #11 Surface TC No. 382 (°F)	Conduit #11 Surface TC No. 383 (°F)	Conduit #11 Surface TC No. 384 (°F)
94	133	131	131	128	330	315	303
95	135	133	133	130	334	319	307
96	137	135	135	132	338	323	310
97	139	137	137	134	342	327	314
98	141	139	139	136	346	331	318
99	143	141	141	138	350	335	321
100	145	143	143	140	354	338	325
101	147	145	144	142	358	343	329
102	149	147	146	144	362	347	333
103	151	149	148	146	367	351	337
104	153	151	150	148	371	355	340
105	155	153	152	151	375	359	344
106	156	155	153	152	379	363	348
107	158	156	155	154	383	367	352
108	160	159	157	156	387	370	355
109	162	160	158	158	391	375	359
110	163	162	160	160	395	379	363
111	164	163	162	161	399	382	367
112	166	165	163	163	403	386	371
113	168	167	165	165	407	390	375
114	169	168	166	166	411	394	379
115	171	170	168	168	414	397	382
116	172	171	169	170	419	401	386
117	173	172	171	171	422	405	389
118	175	174	172	173	426	409	393
119	176	175	174	174	429	412	396
120	177	177	175	176	434	416	400
121	178	177	177	177	438	420	404
122	181	180	178	180	441	424	408
123	180	179	180	179	445	428	411
124	177	176	181	176	449	432	415
125	178	177	183	177	453	436	419
126	178	177	184	177	457	439	422
127	180	179	186	179	460	443	426
128	181	180	187	180	463	446	429
129	183	183	188	182	467	451	434
130	185	184	190	184	471	454	438
131	186	185	191	185	474	458	441
132	188	187	193	187	477	462	444
133	189	188	194	189	481	465	448
134	191	190	196	191	603	469	451
135	193	192	198	193	613	473	455
136	194	194	199	194	614	475	458
137	194	194	200	195	615	477	459
138	196	195	202	196	544	481	462
139	197	197	203	197	619	484	466
140	199	198	204	199	613	487	469

OMEGA POINT LABORATORIES

Time (min)	Conduit #9 Surface TC No. 378 (°F)	Conduit #9 Surface TC No. 379 (°F)	Conduit #9 Surface TC No. 380 (°F)	Conduit #9 Surface TC No. 381 (°F)	Conduit #11 Surface TC No. 382 (°F)	Conduit #11 Surface TC No. 383 (°F)	Conduit #11 Surface TC No. 384 (°F)
141	200	199	205	200	629	490	472
142	201	200	206	201	637	495	475
143	202	201	207	201	644	498	478
144	203	202	207	202	653	632	482
145	203	203	208	202	660	664	485
146	204	203	208	203	664	661	488
147	205	204	209	203	670	668	492
148	205	204	209	204	676	677	495
149	206	205	209	204	679	690	499
150	206	206	209	204	655	698	503
151	207	206	209	204	687	705	508
152	207	207	209	205	693	710	514
153	208	207	209	205	695	716	638
154	209	208	209	206	704	720	632
155	210	209	209	206	710	673	637
156	213	212	209	209	678	681	629
157	214	213	210	209	664	703	633
158	215	214	210	209	722	720	649
159	215	214	210	209	743	699	657
160	216	214	210	209	686	698	663
161	216	214	210	208	666	702	666
162	215	213	211	206	680	712	650
163	216	214	211	206	670	718	672
164	217	215	211	206	702	726	697
165	218	216	212	206	719	736	714
166	219	217	212	206	727	745	720
167	220	218	213	206	735	755	719
168	222	219	214	207	745	765	732
169	223	220	215	207	750	790	740
170	224	222	216	208	755	795	741
171	226	223	216	209	766	796	749
172	227	224	217	210	770	806	766
173	228	225	218	211	787	806	781
174	230	227	219	212	800	813	804
175	231	228	220	213	810	823	822
176	232	229	221	215	820	830	836
177	233	230	222	216	827	836	849
178	235	231	222	217	837	848	847
179	236	233	223	218	847	854	859
180	237	234	224	219	856	864	868

Time (min)	Conduit #11 Surface TC No. 385 (°F)	Conduit #11 Surface TC No. 386 (°F)	Conduit #11 Surface TC No. 387 (°F)	Conduit #11 Surface TC No. 388 (°F)	Conduit #11 Surface TC No. 389 (°F)	Conduit #11 Surface TC No. 390 (°F)	Conduit #12 Surface TC No. 391 (°F)
0	68	68	69	67	67	66	69
1	68	68	68	67	67	66	68
2	65	65	65	64	64	63	66
3	65	65	66	64	64	64	68
4	65	65	65	64	64	63	84
5	65	65	65	64	64	63	99
6	65	65	65	64	64	63	113
7	65	65	65	64	64	63	133
8	65	65	65	64	64	63	156
9	65	65	65	64	64	63	184
10	65	65	66	64	65	64	201
11	65	66	66	64	88	65	203
12	69	70	70	69	149	88	207
13	90	91	92	93	198	161	230
14	90	91	92	100	206	188	232
15	67	68	71	84	183	171	211
16	67	69	76	92	185	174	216
17	68	73	81	101	186	176	230
18	71	78	87	109	187	178	243
19	73	83	94	116	188	179	254
20	77	89	101	123	188	180	265
21	81	96	108	129	188	181	277
22	86	102	115	133	188	181	288
23	92	108	121	137	187	182	299
24	97	114	126	140	186	182	311
25	103	119	130	144	186	182	321
26	108	123	134	146	185	182	332
27	114	128	138	149	184	182	343
28	118	131	141	150	183	182	353
29	123	134	144	152	181	181	365
30	127	138	146	154	181	181	377
31	131	141	149	155	181	183	389
32	135	143	151	157	182	185	402
33	139	146	153	158	183	188	414
34	143	149	156	161	185	191	427
35	147	153	160	163	187	194	440
36	152	157	163	167	188	197	453
37	158	162	168	171	189	201	467
38	164	166	172	174	189	203	479
39	171	171	176	179	191	205	493
40	178	177	181	183	193	206	507
41	185	183	187	188	196	206	521
42	192	189	194	194	199	207	549
43	197	195	199	199	201	206	581
44	201	199	201	202	203	206	653
45	204	202	203	203	204	206	673
46	206	205	205	204	205	206	676

OMEGA POINT LABORATORIES

Time (min)	Conduit #11 Surface TC No. 385 (°F)	Conduit #11 Surface TC No. 386 (°F)	Conduit #11 Surface TC No. 387 (°F)	Conduit #11 Surface TC No. 388 (°F)	Conduit #11 Surface TC No. 389 (°F)	Conduit #11 Surface TC No. 390 (°F)	Conduit #12 Surface TC No. 391 (°F)
47	207	206	206	205	206	206	687
48	208	207	207	205	207	206	687
49	208	207	208	206	208	206	701
50	208	208	208	207	208	206	696
51	208	208	209	207	209	207	705
52	208	208	209	207	209	207	728
53	208	208	209	208	209	207	709
54	208	208	209	208	210	207	754
55	209	208	210	208	210	207	768
56	209	208	210	208	211	207	782
57	209	208	210	208	211	207	796
58	209	208	210	209	212	208	806
59	210	208	211	209	212	208	820
60	210	208	211	209	212	208	836
61	211	208	211	210	213	208	844
62	211	209	213	211	213	208	849
63	212	209	215	212	214	208	867
64	213	210	218	214	215	209	873
65	214	212	220	216	215	209	881
66	215	215	223	217	216	210	890
67	217	217	226	219	217	211	870
68	219	219	229	221	218	211	901
69	221	221	232	223	220	212	911
70	223	224	235	225	221	213	912
71	225	226	238	228	223	214	900
72	228	229	241	230	225	215	932
73	231	232	244	233	227	216	956
74	235	236	248	236	229	218	967
75	238	239	251	239	231	219	975
76	241	243	254	241	234	221	991
77	245	246	257	244	236	223	1016
78	248	250	261	247	239	226	1013
79	252	253	264	250	241	228	1014
80	256	257	268	252	244	231	1012
81	259	260	271	255	247	233	1023
82	263	264	274	258	249	236	1037
83	267	267	277	261	252	239	1051
84	270	271	281	263	255	241	1070
85	274	274	284	266	258	244	1083
86	277	278	287	269	261	247	1091
87	281	281	290	273	264	249	1097
88	284	285	293	276	267	252	1102
89	288	288	297	279	270	255	1108
90	292	292	300	282	274	257	1115
91	295	295	303	285	277	260	1122
92	299	298	307	289	280	263	1127
93	302	302	310	292	283	266	1133

Time (min)	Conduit #11 Surface TC No. 385 (°F)	Conduit #11 Surface TC No. 386 (°F)	Conduit #11 Surface TC No. 387 (°F)	Conduit #11 Surface TC No. 388 (°F)	Conduit #11 Surface TC No. 389 (°F)	Conduit #11 Surface TC No. 390 (°F)	Conduit #12 Surface TC No. 391 (°F)
94	305	305	313	295	286	269	1138
95	309	309	317	298	289	272	1143
96	312	312	320	301	292	275	1146
97	316	316	323	304	295	277	1149
98	319	319	327	307	298	281	1154
99	323	323	331	311	301	284	1159
100	327	327	334	314	304	287	1165
101	330	331	338	318	307	290	1170
102	334	334	342	321	310	293	1176
103	338	338	345	325	314	296	1182
104	342	342	349	328	317	299	1187
105	346	346	353	332	320	302	1193
106	350	349	357	335	323	305	1198
107	354	353	360	339	326	308	1206
108	357	357	364	342	329	311	1211
109	362	361	368	346	332	314	1216
110	365	365	372	350	336	317	1221
111	369	369	376	353	339	320	1226
112	373	373	380	357	342	323	1231
113	377	377	384	360	345	327	1235
114	381	380	388	364	349	330	1240
115	384	384	391	367	351	332	1245
116	388	387	395	371	355	335	1250
117	392	391	398	374	358	338	1254
118	396	395	402	378	361	342	1259
119	399	398	405	381	364	344	1263
120	403	402	409	385	367	348	1268
121	407	405	413	388	371	351	1273
122	410	409	416	392	374	354	1277
123	414	413	420	396	377	358	1283
124	418	416	424	399	380	361	1288
125	422	420	427	403	384	364	1293
126	425	423	431	406	386	367	1297
127	429	427	434	409	389	370	1302
128	432	430	437	412	392	373	1306
129	437	434	441	417	396	377	1312
130	440	437	444	420	399	380	1316
131	444	441	447	423	401	383	1320
132	447	444	450	426	404	386	1324
133	450	447	453	429	407	389	1329
134	454	450	456	432	438	392	1333
135	457	454	459	435	459	395	1337
136	460	456	462	438	487	397	1342
137	461	457	463	439	477	397	1345
138	465	461	465	441	451	400	1349
139	468	464	468	444	435	403	1354
140	471	467	471	447	427	406	1359

OMEGA POINT LABORATORIES

Time (min)	Conduit #11 Surface TC No. 385 (°F)	Conduit #11 Surface TC No. 386 (°F)	Conduit #11 Surface TC No. 387 (°F)	Conduit #11 Surface TC No. 388 (°F)	Conduit #11 Surface TC No. 389 (°F)	Conduit #11 Surface TC No. 390 (°F)	Conduit #12 Surface TC No. 391 (°F)
141	474	470	475	450	432	409	1364
142	478	473	619	452	429	411	1369
143	481	476	637	455	431	414	1374
144	484	479	642	458	434	417	1379
145	488	483	648	460	437	419	1385
146	492	486	653	463	448	422	1390
147	496	527	657	466	444	547	1395
148	500	532	662	469	587	553	1401
149	505	537	668	471	448	557	1406
150	510	536	674	474	451	545	1411
151	571	537	680	477	453	536	1417
152	577	511	686	481	456	437	1423
153	583	490	689	560	459	440	1429
154	692	440	695	623	462	443	1432
155	628	473	699	708	465	518	1393
156	631	558	673	662	654	533	1380
157	641	634	541	644	660	609	1425
158	653	645	581	610	670	630	1455
159	664	654	685	633	680	645	1179
160	677	662	720	669	689	657	762
161	689	677	726	672	698	667	740
162	700	662	739	680	709	678	738
163	710	694	752	690	719	686	734
164	721	699	756	700	727	703	747
165	731	687	757	712	738	707	756
166	741	718	776	721	750	717	768
167	750	731	778	733	761	728	774
168	761	728	792	743	770	736	777
169	771	760	800	754	787	744	791
170	782	779	818	766	797	752	796
171	792	790	821	777	807	761	796
172	803	795	810	788	817	764	799
173	813	806	804	799	829	774	804
174	823	814	809	807	840	781	810
175	833	825	813	804	851	786	817
176	843	834	818	821	867	795	820
177	853	842	819	829	877	782	822
178	864	831	823	829	886	796	828
179	874	862	828	839	887	811	834
180	886	879	847	857	908	820	839

Time (min)	Conduit #12 Surface TC No. 392 (°F)	Conduit #12 Surface TC No. 393 (°F)	Conduit #12 Surface TC No. 394 (°F)	Conduit #12 Surface TC No. 395 (°F)	Conduit #12 Surface TC No. 396 (°F)	Conduit #12 Surface TC No. 397 (°F)	Conduit #12 Surface TC No. 398 (°F)
0	68	69	69	69	69	69	68
1	68	69	69	69	69	69	67
2	65	66	66	66	66	66	64
3	66	70	68	75	73	67	65
4	70	84	79	100	97	76	65
5	81	97	92	117	114	88	66
6	95	110	107	130	128	97	70
7	112	125	129	150	143	111	75
8	130	140	146	172	159	125	82
9	157	169	170	195	181	148	95
10	193	201	195	203	198	184	128
11	202	203	203	203	203	203	188
12	206	207	209	208	214	213	208
13	227	230	232	235	233	230	225
14	227	231	234	235	242	232	225
15	203	209	210	223	227	209	199
16	205	217	212	236	239	212	200
17	212	226	229	250	254	223	202
18	218	238	240	263	270	239	204
19	233	249	253	277	284	252	209
20	242	260	264	290	298	264	216
21	251	271	276	303	311	277	224
22	259	283	288	316	325	289	232
23	268	295	300	330	339	302	241
24	277	307	313	343	353	314	249
25	285	318	325	358	367	326	258
26	292	330	337	373	382	340	268
27	301	343	350	388	397	353	278
28	310	356	363	404	414	366	287
29	320	369	377	421	432	381	297
30	332	383	391	439	450	396	361
31	345	397	405	456	469	411	337
32	356	411	420	474	487	427	379
33	369	426	435	492	505	442	451
34	381	440	450	510	577	549	462
35	393	528	465	638	629	570	451
36	405	546	489	656	634	587	598
37	418	562	528	673	590	585	713
38	431	577	540	665	612	593	740
39	444	592	541	700	652	609	756
40	457	567	560	657	707	631	760
41	470	667	608	730	689	721	759
42	484	616	662	746	704	752	758
43	599	690	703	760	743	764	777
44	682	649	691	772	833	781	794
45	715	681	698	784	791	794	807
46	717	723	705	798	719	801	781

OMEGA POINT LABORATORIES

Time (min)	Conduit #12 Surface TC No. 392 (°F)	Conduit #12 Surface TC No. 393 (°F)	Conduit #12 Surface TC No. 394 (°F)	Conduit #12 Surface TC No. 395 (°F)	Conduit #12 Surface TC No. 396 (°F)	Conduit #12 Surface TC No. 397 (°F)	Conduit #12 Surface TC No. 398 (°F)
47	675	696	718	811	710	826	782
48	586	710	724	827	689	841	765
49	578	719	734	845	797	855	790
50	590	786	730	870	841	859	799
51	602	773	735	899	900	884	779
52	623	770	753	915	798	847	772
53	584	694	830	896	830	863	816
54	667	740	808	903	808	751	877
55	686	789	829	904	835	759	856
56	652	769	818	894	821	770	852
57	667	730	848	905	855	780	863
58	658	732	853	897	890	788	868
59	677	752	864	867	915	799	870
60	688	757	870	841	915	816	897
61	677	767	878	843	933	826	852
62	721	784	883	876	924	834	862
63	716	787	901	876	955	849	893
64	747	788	912	891	966	851	912
65	740	796	919	914	945	868	932
66	790	807	933	920	942	869	936
67	808	820	944	927	958	868	947
68	808	830	947	937	942	884	940
69	819	844	962	947	952	892	944
70	855	854	972	1000	906	897	943
71	865	870	982	958	933	902	982
72	860	882	995	985	995	921	991
73	900	957	1001	975	981	933	1005
74	1011	948	1011	982	1018	951	1018
75	957	936	1021	987	987	942	1004
76	967	957	1031	995	985	962	1002
77	1044	964	1037	1002	1030	1019	1005
78	1044	984	1041	1010	1038	1010	1008
79	997	1022	1048	1017	1040	1013	1012
80	1033	1011	1056	1025	1043	995	1017
81	1024	993	1064	1032	1048	997	1022
82	1054	1027	1072	1036	1051	1013	1027
83	1043	1016	1080	1043	1055	1014	1033
84	1031	1022	1088	1049	1055	1023	1031
85	1030	1020	1097	1056	1043	1035	999
86	1037	1020	1106	1063	1048	1042	1036
87	1039	1025	1112	1063	1052	1048	1020
88	1041	1032	1118	1065	1052	1053	1036
89	1046	1039	1125	1072	1053	1058	1036
90	1052	1045	1131	1079	1057	1063	1033
91	1058	1050	1139	1087	1055	1067	1035
92	1064	1058	1099	1094	1058	1073	1040
93	1069	1065	1122	1101	1062	1077	1043

Time (min)	Conduit #12 Surface TC No. 392 (°F)	Conduit #12 Surface TC No. 393 (°F)	Conduit #12 Surface TC No. 394 (°F)	Conduit #12 Surface TC No. 395 (°F)	Conduit #12 Surface TC No. 396 (°F)	Conduit #12 Surface TC No. 397 (°F)	Conduit #12 Surface TC No. 398 (°F)
94	1075	1071	1063	1107	1067	1082	1045
95	1080	1072	1064	1113	1072	1086	1052
96	1084	1079	1047	1119	1078	1090	1058
97	1089	1086	1046	1124	1083	1094	1064
98	1094	1093	1048	1130	1090	1099	1070
99	1100	1101	1052	1136	1096	1105	1077
100	1107	1108	1057	1142	1103	1111	1083
101	1113	1116	1063	1148	1109	1118	1090
102	1120	1124	1070	1154	1116	1124	1097
103	1128	1132	1078	1160	1122	1131	1104
104	1133	1140	1085	1165	1128	1137	1110
105	1139	1147	1093	1171	1134	1142	1116
106	1145	1155	1101	1176	1140	1149	1122
107	1151	1162	1109	1182	1146	1157	1129
108	1157	1169	1115	1187	1153	1162	1136
109	1163	1176	1122	1193	1159	1168	1143
110	1168	1183	1129	1198	1165	1174	1149
111	1174	1190	1136	1204	1171	1180	1156
112	1179	1197	1142	1209	1178	1185	1162
113	1184	1204	1149	1215	1184	1191	1169
114	1190	1211	1156	1221	1190	1197	1175
115	1195	1216	1162	1226	1196	1203	1182
116	1201	1223	1168	1232	1203	1209	1188
117	1206	1230	1175	1237	1208	1214	1194
118	1211	1237	1181	1243	1215	1220	1201
119	1215	1242	1186	1247	1220	1224	1207
120	1220	1248	1193	1253	1226	1230	1213
121	1226	1255	1200	1259	1232	1235	1220
122	1231	1261	1206	1264	1238	1240	1226
123	1236	1267	1212	1270	1245	1247	1232
124	1242	1274	1218	1276	1251	1252	1239
125	1247	1280	1225	1282	1257	1258	1245
126	1251	1285	1230	1287	1262	1263	1250
127	1256	1291	1236	1292	1268	1267	1255
128	1261	1296	1241	1297	1273	1273	1261
129	1267	1302	1247	1303	1280	1279	1267
130	1271	1306	1253	1308	1284	1283	1273
131	1275	1309	1258	1313	1289	1288	1278
132	1280	1313	1263	1318	1294	1292	1283
133	1284	1317	1269	1323	1299	1296	1289
134	1289	1322	1274	1328	1305	1301	1295
135	1293	1328	1279	1333	1311	1306	1300
136	1298	1334	1284	1338	1317	1311	1304
137	1300	1338	1288	1341	1320	1314	1308
138	1305	1344	1283	1347	1325	1319	1313
139	1310	1351	1236	1352	1331	1324	1319
140	1315	1358	1129	1358	1337	1330	1325

Time (min)	Conduit #12 Surface TC No. 392 (°F)	Conduit #12 Surface TC No. 393 (°F)	Conduit #12 Surface TC No. 394 (°F)	Conduit #12 Surface TC No. 395 (°F)	Conduit #12 Surface TC No. 396 (°F)	Conduit #12 Surface TC No. 397 (°F)	Conduit #12 Surface TC No. 398 (°F)
141	1321	1364	1037	1364	1343	1337	1331
142	1326	1370	987	1370	1349	1342	1338
143	1331	1376	945	1375	1354	1348	1344
144	1337	1382	935	1381	1360	1354	1350
145	1343	1389	933	1387	1366	1360	1358
146	1346	1394	933	1392	1371	1365	1364
147	1352	1400	936	1398	1376	1370	1370
148	1357	1405	939	1403	1382	1375	1376
149	1362	1410	941	1409	1387	1380	1382
150	1368	1415	946	1414	1393	1386	1389
151	1374	1421	959	1420	1399	1392	1395
152	1382	1426	1048	1425	1406	1399	1402
153	655	1432	1281	1431	1412	1403	1409
154	642	1437	1390	1436	1417	1407	1413
155	647	1443	1303	1441	1423	1414	1416
156	657	1448	1094	1376	1426	1421	1424
157	666	1454	1028	1377	1430	1428	1432
158	678	1459	1074	1370	1437	1432	1438
159	690	1464	977	718	1445	1440	1443
160	702	1469	999	710	1451	1447	1447
161	714	1103	1050	710	1457	1453	1451
162	726	963	892	662	1464	1459	1461
163	737	776	870	651	1470	1465	1467
164	749	744	888	647	1476	1338	708
165	760	713	893	656	1482	1261	716
166	770	761	892	668	1291	1191	733
167	780	742	935	679	1238	1160	701
168	790	743	789	690	1239	1158	697
169	795	762	807	700	1245	1162	700
170	807	759	802	709	1257	1196	708
171	707	748	794	716	1257	1176	720
172	699	755	796	719	1262	1201	732
173	693	764	804	724	1272	1215	742
174	729	773	809	732	1283	1222	746
175	730	786	815	736	1279	1211	757
176	732	793	823	742	1284	1214	761
177	727	800	832	756	1301	1255	764
178	738	805	840	768	1305	1257	769
179	754	811	845	779	955	1332	781
180	768	817	850	795	899	1302	787

OMEGA POINT LABORATORIES

Time (min)	Conduit #12 Surface TC No. 399 (°F)	JB#2 TC No. 400 (°F)	JB#2 TC No. 401 (°F)	JB#2 TC No. 402 (°F)	JB#2 TC No. 403 (°F)	JB#2 TC No. 404 (°F)	Trapeze Hanger TC No. 405 (°F)	Trapeze Hanger TC No. 406 (°F)	Trapeze Hanger TC No. 407 (°F)	Trapeze Hanger TC No. 408 (°F)
0	68	62	63	63	63	62	69	69	70	70
1	67	62	63	63	63	63	69	69	70	70
2	64	61	61	62	62	61	66	66	67	67
3	65	60	60	60	60	60	66	67	67	67
4	65	60	60	61	61	60	66	66	67	66
5	67	61	61	62	61	61	65	66	66	66
6	72	61	62	62	62	62	65	66	66	66
7	78	61	62	62	62	62	65	66	67	66
8	87	61	61	62	62	61	65	66	67	67
9	105	61	61	61	61	61	66	66	67	67
10	153	61	61	61	61	61	66	67	67	67
11	190	60	61	61	61	60	67	67	68	68
12	208	60	61	61	61	61	77	78	78	79
13	229	61	61	61	61	61	93	94	96	97
14	232	61	61	61	61	61	94	95	96	97
15	206	59	60	60	60	60	71	71	72	72
16	205	59	60	60	60	60	72	72	73	74
17	204	59	59	59	59	59	73	74	75	78
18	206	58	58	59	59	58	75	76	77	81
19	208	57	58	58	58	57	77	78	79	85
20	219	56	57	57	57	56	80	80	82	90
21	230	56	56	56	56	56	82	83	85	94
22	238	54	55	55	55	55	85	87	88	99
23	247	54	54	54	54	54	88	90	92	105
24	255	53	54	54	54	53	91	96	96	109
25	264	53	53	53	53	53	95	102	100	113
26	273	53	53	53	53	53	98	110	103	117
27	283	52	53	53	53	52	102	117	107	120
28	292	55	55	56	55	55	106	123	111	123
29	302	58	58	59	58	58	110	130	115	127
30	517	53	53	53	53	53	114	149	119	131
31	407	53	54	54	54	53	119	186	123	135
32	602	58	59	59	59	58	123	204	127	139
33	599	59	60	60	60	59	128	208	131	143
34	641	59	60	60	60	59	141	208	135	147
35	486	60	61	61	61	60	198	208	139	151
36	753	60	61	61	61	60	207	208	142	154
37	790	60	61	61	61	60	208	209	146	159
38	797	61	62	62	62	60	208	209	149	162
39	813	63	65	64	64	62	208	208	153	166
40	763	65	66	66	65	64	208	208	157	169
41	723	65	67	66	66	64	208	209	160	174
42	816	67	69	68	68	66	209	209	164	178
43	884	66	68	67	67	65	208	209	168	182
44	931	66	68	67	67	66	208	209	173	187
45	946	67	68	68	67	68	209	209	179	192
46	924	69	69	69	69	72	209	209	184	197

OMEGA POINT LABORATORIES

Time (min)	Conduit #12 Surface TC No. 399 (°F)	JB#2 TC No. 400 (°F)	JB#2 TC No. 401 (°F)	JB#2 TC No. 402 (°F)	JB#2 TC No. 403 (°F)	JB#2 TC No. 404 (°F)	Trapeze Hanger TC No. 405 (°F)	Trapeze Hanger TC No. 406 (°F)	Trapeze Hanger TC No. 407 (°F)	Trapeze Hanger TC No. 408 (°F)
47	851	72	72	70	71	77	209	209	190	202
48	820	77	75	73	75	82	208	209	195	208
49	827	82	79	76	80	89	209	209	201	213
50	736	87	86	79	85	96	209	209	207	219
51	733	93	94	84	92	105	209	210	213	226
52	734	99	101	90	100	114	209	216	220	231
53	732	106	110	97	108	124	209	222	226	236
54	751	114	118	105	118	134	210	227	231	242
55	757	123	126	113	128	144	224	232	237	248
56	762	131	134	121	138	155	234	238	243	253
57	768	141	143	131	149	166	242	244	249	259
58	776	152	154	142	162	183	250	251	255	265
59	784	164	166	154	177	196	258	259	261	271
60	807	173	175	171	194	217	266	267	267	277
61	815	184	186	184	205	241	273	275	273	283
62	826	194	196	194	207	266	280	283	279	294
63	841	203	206	203	211	290	287	291	285	295
64	842	212	215	214	219	313	294	299	291	357
65	854	221	225	225	231	334	301	306	297	308
66	859	231	234	237	243	353	308	313	303	385
67	866	240	243	248	254	370	314	320	309	397
68	877	251	254	261	265	387	320	327	636	412
69	888	262	265	274	277	407	327	334	651	657
70	894	273	275	286	289	440	333	341	664	672
71	902	285	286	297	301	477	339	348	676	674
72	919	296	296	311	315	513	345	355	687	703
73	937	309	308	327	330	551	350	361	696	710
74	955	341	340	362	370	752	356	367	695	716
75	959	390	391	423	422	1148	362	373	432	729
76	970	464	466	508	684	1135	367	378	358	721
77	1003	573	560	630	817	1137	372	384	727	745
78	1007	705	642	772	764	1161	377	389	740	759
79	1015	780	712	852	792	1129	382	394	753	745
80	1005	833	771	963	838	1141	387	398	768	750
81	1006	883	845	1191	896	1242	391	402	780	741
82	1026	1213	1028	1285	1024	1267	395	406	792	796
83	1018	1430	1237	1374	1242	1411	399	410	805	820
84	1024	1463	1394	1459	1402	1494	402	414	818	744
85	1016	1524	1493	1550	1505	1567	405	418	830	755
86	1037	1562	1540	1565	1565	1556	409	421	843	772
87	1029	1556	1540	1510	1548	1536	412	425	860	810
88	1041	1577	1546	1501	1547	1495	416	430	873	816
89	1042	1606	1570	1527	1581	1605	420	435	885	870
90	1045	1622	1597	1596	1596	1626	424	439	907	887
91	1054	1638	1612	1597	1611	1641	428	444	914	897
92	1060	1647	1623	1580	1618	1652	432	448	901	902
93	1057	1645	1611	1549	1608	1660	437	453	901	923

OMEGA POINT LABORATORIES

Time (min)	Conduit #12 Surface TC No. 399 (°F)	JB#2 TC No. 400 (°F)	JB#2 TC No. 401 (°F)	JB#2 TC No. 402 (°F)	JB#2 TC No. 403 (°F)	JB#2 TC No. 404 (°F)	Trapeze Hanger TC No. 405 (°F)	Trapeze Hanger TC No. 406 (°F)	Trapeze Hanger TC No. 407 (°F)	Trapeze Hanger TC No. 408 (°F)
94	1056	1639	1598	1534	1585	1666	441	457	915	933
95	1061	1607	1538	1487	1499	1649	445	461	930	926
96	1067	1547	1473	1451	1455	1605	449	466	943	887
97	1073	1499	1453	1441	1468	1499	453	470	963	911
98	1080	1474	1441	1441	1443	1452	458	474	985	932
99	1086	1459	1442	1446	1421	1436	462	479	1002	962
100	1093	1428	1427	1438	1372	1426	466	483	1017	1019
101	1100	1337	1408	1410	1343	1382	471	673	1031	1051
102	1107	1312	1384	1370	1334	1356	475	686	1032	1051
103	1115	1315	1401	1382	1341	1353	480	698	1039	1046
104	1122	1325	1409	1389	1350	1373	484	712	1047	1047
105	1129	1329	1408	1387	1363	1386	489	720	1058	1048
106	1136	1355	1415	1401	1370	1406	493	734	1063	1042
107	1143	1379	1423	1412	1381	1429	498	726	1079	951
108	1150	1414	1437	1441	1394	1469	502	751	1086	941
109	1157	1435	1444	1455	1406	1483	507	761	1092	899
110	1164	1460	1458	1478	1417	1513	512	767	1096	891
111	1170	1492	1483	1516	1437	1541	516	789	1099	909
112	1177	1501	1479	1519	1447	1538	520	803	1102	980
113	1184	1528	1497	1543	1462	1565	524	788	1105	1073
114	1191	1553	1519	1559	1476	1594	528	745	1108	1073
115	1197	1567	1530	1577	1482	1611	531	739	1110	1076
116	1204	1583	1534	1602	1499	1634	534	766	1112	1087
117	1210	1593	1537	1623	1509	1650	537	767	1114	1091
118	1217	1600	1552	1651	1512	1655	540	760	1117	1102
119	1223	1603	1544	1671	1523	1671	542	765	1119	1102
120	1230	1610	1552	1679	1527	1675	545	776	1122	1094
121	1237	1614	1555	1687	1530	1686	548	784	1125	1053
122	1243	1618	1556	1693	1534	1700	550	800	1128	1026
123	1250	1612	1549	1674	1527	1715	552	816	1132	1020
124	1257	1607	1546	1656	1523	1715	555	829	1136	1020
125	1264	1605	1549	1654	1525	1722	633	868	1140	1012
126	1270	1605	1556	1658	1525	1725	840	906	1144	1006
127	1276	1602	1557	1658	1527	1731	598	940	1148	1007
128	1282	1599	1560	1660	1526	1733	636	934	1153	1011
129	1289	1598	1568	1660	1526	1724	655	972	1158	1015
130	1295	1600	1574	1664	1532	1736	675	983	1164	1021
131	1301	1595	1577	1665	1536	1747	697	995	1169	1025
132	1306	1590	1581	1666	1553	1753	723	999	1174	1031
133	1312	1587	1581	1652	1545	1763	850	1010	1179	1036
134	1317	1590	1588	1657	1549	1762	927	1026	1185	1041
135	1323	1592	1590	1658	1554	1772	979	1039	1190	1045
136	1329	1594	1592	1660	1554	1776	1006	1047	1194	1046
137	1333	1593	1591	1663	1553	1775	1014	1055	1198	1043
138	1339	1597	1598	1666	1557	1779	1029	1064	1203	1041
139	1345	1600	1602	1669	1557	1782	1038	1073	1208	1038
140	1352	1605	1611	1671	1563	1785	1047	1082	1214	1035

OMEGA POINT LABORATORIES

Time (min)	Conduit #12 Surface TC No. 399 (°F)	JB#2 TC No. 400 (°F)	JB#2 TC No. 401 (°F)	JB#2 TC No. 402 (°F)	JB#2 TC No. 403 (°F)	JB#2 TC No. 404 (°F)	Trapeze Hanger TC No. 405 (°F)	Trapeze Hanger TC No. 406 (°F)	Trapeze Hanger TC No. 407 (°F)	Trapeze Hanger TC No. 408 (°F)
141	1358	1616	1617	1687	1589	1793	1055	1088	1219	1032
142	1364	1613	1615	1683	1572	1793	1065	1094	1224	1033
143	1370	1614	1618	1685	1571	1797	1074	1099	1229	1036
144	1376	1616	1620	1685	1568	1799	1082	1077	1233	1041
145	1382	1617	1623	1685	1569	1801	1091	1088	1236	1046
146	1388	1618	1623	1683	1571	1803	1100	1089	1239	1035
147	1393	1617	1623	1682	1570	1800	1108	1144	672	1056
148	1399	1609	1620	1685	1574	1802	1115	1137	677	698
149	1405	1607	1623	1684	1577	1799	1122	780	680	649
150	1410	1609	1629	1684	1577	1799	1130	769	691	659
151	1416	1615	1635	1687	1592	1805	1137	994	702	670
152	1421	1610	1629	1684	1581	1804	1144	798	708	686
153	1427	1609	1631	1707	1581	1802	1151	1137	717	691
154	1432	1616	1637	1719	1584	1804	1157	1201	732	707
155	1437	1614	1634	1725	1584	1807	1164	1036	742	641
156	1443	1625	1642	1726	1591	1807	1172	897	751	629
157	1448	1631	1644	1727	1595	1809	1180	1231	762	642
158	1454	1631	1646	1726	1599	1813	1188	1107	768	657
159	1459	1638	1650	1719	1600	1811	1198	1131	781	668
160	1465	1635	1648	1714	1603	1812	1209	706	792	675
161	1470	1634	1646	1707	1602	1812	1223	727	805	682
162	1476	1631	1645	1701	1600	1809	1240	740	814	694
163	1482	1633	1645	1698	1601	1807	1259	748	823	707
164	1332	1634	1647	1698	1600	1807	1286	746	832	717
165	1321	1633	1647	1698	1601	1808	1307	765	840	727
166	1306	1638	1655	1697	1601	1812	1317	749	841	739
167	1287	1639	1654	1695	1595	1809	1328	764	847	751
168	1255	1634	1651	1691	1590	1808	1339	772	854	761
169	1182	1630	1650	1699	1575	1808	1361	783	856	769
170	993	1636	1654	1701	1583	1802	1364	794	861	780
171	891	1633	1651	1700	1576	1807	1365	807	866	789
172	881	1634	1651	1690	1597	1809	1367	818	874	803
173	951	1629	1650	1698	1576	1804	1369	830	882	813
174	960	1632	1655	1701	1582	1797	1370	843	896	822
175	950	1628	1652	1698	1579	1795	1372	856	908	836
176	949	1628	1653	1707	1573	1793	1375	866	918	861
177	967	1627	1654	1707	1587	1790	1378	876	932	875
178	949	1624	1651	1698	1585	1792	1381	887	945	889
179	937	1623	1651	1696	1574	1798	1384	897	958	907
180	930	1622	1651	1694	1576	1798	1387	911	969	923

OMEGA POINT LABORATORIES

Time (min)	Trapeze Hanger TC No. 409 (°F)	Trapeze Hanger TC No. 410 (°F)	Trapeze Hanger TC No. 411 (°F)	Trapeze Hanger TC No. 412 (°F)
0	70	69	69	69
1	70	69	69	69
2	66	66	66	66
3	67	66	67	66
4	66	66	66	66
5	66	66	66	66
6	66	66	66	66
7	66	66	66	66
8	66	66	66	66
9	67	66	66	67
10	67	67	67	67
11	67	67	67	68
12	79	78	78	77
13	97	96	96	122
14	97	96	97	165
15	71	71	72	165
16	72	72	73	178
17	73	73	77	183
18	75	75	84	187
19	77	78	97	191
20	79	80	117	193
21	82	82	142	195
22	84	85	162	197
23	87	88	175	198
24	90	92	182	198
25	94	96	188	198
26	97	100	192	199
27	101	104	195	199
28	105	109	197	199
29	109	113	198	199
30	114	118	200	200
31	118	124	200	201
32	122	128	201	201
33	127	133	202	202
34	132	139	202	202
35	137	144	203	203
36	142	149	204	204
37	148	154	206	206
38	152	158	207	207
39	156	162	208	209
40	160	167	208	209
41	165	174	208	209
42	169	183	209	209
43	173	194	209	209
44	178	202	209	209
45	184	207	209	209
46	189	207	209	209

OMEGA POINT LABORATORIES

Time (min)	Trapeze Hanger TC No. 409 (°F)	Trapeze Hanger TC No. 410 (°F)	Trapeze Hanger TC No. 411 (°F)	Trapeze Hanger TC No. 412 (°F)
47	194	208	209	209
48	199	209	209	209
49	207	211	209	209
50	214	216	209	210
51	217	219	209	210
52	221	221	209	210
53	225	226	209	210
54	230	232	209	210
55	236	239	209	210
56	242	246	209	212
57	248	253	210	219
58	254	260	214	224
59	260	267	219	229
60	266	274	227	234
61	272	281	235	238
62	278	288	242	245
63	284	294	249	253
64	290	301	256	261
65	296	307	263	270
66	302	313	270	279
67	311	318	276	287
68	317	324	283	295
69	323	330	290	303
70	329	336	297	311
71	334	341	303	319
72	340	347	310	326
73	345	352	316	333
74	350	358	322	340
75	520	423	328	346
76	683	642	334	353
77	693	660	340	359
78	711	672	346	365
79	720	680	351	371
80	732	680	357	377
81	729	686	362	382
82	735	683	367	387
83	741	687	372	392
84	745	696	377	396
85	751	706	381	400
86	755	718	386	404
87	754	728	391	407
88	758	738	403	411
89	751	749	419	415
90	759	763	450	421
91	770	775	439	430
92	781	787	453	440
93	791	805	461	446

OMEGA POINT LABORATORIES

Time (min)	Trapeze Hanger TC No. 409 (°F)	Trapeze Hanger TC No. 410 (°F)	Trapeze Hanger TC No. 411 (°F)	Trapeze Hanger TC No. 412 (°F)
94	805	809	461	449
95	812	807	464	450
96	824	815	474	454
97	836	826	484	464
98	846	835	501	472
99	856	846	516	478
100	866	855	537	483
101	876	865	593	483
102	887	875	564	489
103	894	882	577	494
104	903	892	614	498
105	910	901	624	504
106	920	910	746	511
107	930	920	757	513
108	940	931	763	519
109	950	955	749	528
110	961	983	774	530
111	971	985	811	536
112	981	1002	830	543
113	993	1008	800	554
114	1011	1014	812	562
115	1015	1019	858	565
116	1020	1024	902	564
117	1024	1025	918	566
118	1031	1030	956	566
119	1033	1034	967	562
120	1038	1040	971	558
121	1041	1047	968	560
122	1042	1053	972	561
123	1046	1059	974	558
124	1049	1065	974	558
125	1050	1071	973	561
126	1051	1075	971	571
127	1053	1078	970	629
128	1056	1078	969	648
129	1060	1077	967	652
130	1066	1076	967	663
131	1071	1075	966	674
132	1075	1072	969	685
133	1079	1064	972	696
134	1082	1060	974	711
135	1085	1062	976	717
136	1086	1066	975	732
137	1086	1069	975	745
138	1087	1025	977	763
139	1090	973	979	780
140	1094	1002	982	798

Time (min)	Trapeze Hanger TC No. 409 (°F)	Trapeze Hanger TC No. 410 (°F)	Trapeze Hanger TC No. 411 (°F)	Trapeze Hanger TC No. 412 (°F)
141	1098	1010	951	816
142	1103	1051	931	834
143	1108	1000	952	854
144	1113	1111	961	878
145	1119	1116	983	917
146	1124	1072	981	961
147	1129	1125	988	993
148	1134	1123	967	1016
149	1139	1067	957	1033
150	1144	1143	956	1048
151	1150	1149	960	1062
152	1155	1154	940	1075
153	1160	1159	883	697
154	1165	1139	886	699
155	1222	1113	620	708
156	639	1172	624	718
157	646	690	628	729
158	656	695	634	739
159	665	718	636	741
160	681	735	646	753
161	693	745	653	761
162	720	751	665	771
163	716	758	678	780
164	734	762	690	789
165	1006	770	698	799
166	717	775	708	809
167	738	780	719	819
168	746	784	731	829
169	759	793	740	819
170	752	805	748	823
171	767	811	699	813
172	780	835	697	821
173	796	843	728	848
174	811	843	733	859
175	827	841	733	869
176	833	744	747	867
177	850	746	749	881
178	872	732	750	903
179	892	730	769	926
180	918	740	771	949

Appendix E

QUALITY ASSURANCE

OMEGA POINT LABORATORIES

ACCEPTABILITY DOCUMENTATION

TEST ARTICLE PROJECT NO. 102570

The following signatures attest to the review and acceptance of each attribute listed regarding the above-noted test article:

I. CONDUIT ASSEMBLY

C Humphrey — 3/9/98
Omega Point Laboratories, Inc. — Date

3/10/98
Promatec Technologies, Inc. — Date

II. THERMOCOUPLE INSTALLATION

C Humphrey — 3/9/98
Omega Point Laboratories, Inc. — Date

3/10/98
Promatec Technologies, Inc. — Date

Omega Point Laboratories, Inc.
16015 Shady Falls Road
Elmendorf, Texas 78112-9784
210-635-8100 / FAX: 210-635-8101 / 800-966-5253
www.opl.com / e-mail: moreinfo@opl.com

III. FIRE PROTECTION BARRIER

Omega Point Laboratories, Inc. — Date: 3/19/98

Promatec Technologies, Inc. — Date: 3/19/98

IV. FINAL PRE-BURN INSPECTION

Omega Point Laboratories, Inc. — Date: 3/19/98

Promatec Technologies, Inc. — Date: 3/19/98

OMEGA POINT LABORATORIES

PROMATEC®
TECHNOLOGIES, INC.

May 12, 1998

Omega Point Laboratories Inc.
16015 Shady Falls Road
Elmendorf, TX. 78112

Attn. Deg Priest

Subject: CTP-2009 OPL Project 8610-102570

Dear Deg:

Enclosed please find related documentation to Promatec's recent fire test; your project 8610-102570 This includes the installation procedure and drawings, training and installation records and the material receiving reports.

Should you have any questions, please contact me at (281) 256-2901.

Sincerely,

Michael Murphy
Technical Services Manager

Cc: File
R. Brown
L.C. Spriggs

P.O. BOX 309 • CYPRESS, TEXAS 77410-0309
(281) 373-4040 • FAX (281) 256-2694

PROJECT NAME:	OMEGA POINT LABORATORIES	REPORT NUMBER:	001
PROJECT LOCATION	ELMENDORF, TX.	DATE RECEIVED:	3-9-98
PROJECT NUMBER:	8610-102570	DATE INSPECTED:	3-9-98
RECEIVED FROM:	CORPORATE	INSPECTED BY:	MDM
	CTP-2009		

RECEIVING REPORT

FORM QC-15
03/01/80

Rev. 1-01/27/81

Rev. 2-12/01/83

REF: QCP 0008

ITEM (include unit description)	P.O. NO. ORDER NO.	QUANTITY ORDER	QUANTITY REC'D	QUANTITY B.O.	I.D. NUMBER	CONTROL MAT'L	CERT REC'D	CONTAINER INTEGRITY	EXCEPTIONS	ACCEPTANCE ACCEPT	ACCEPTANCE HOLD	ACCEPTANCE REJECT	REMARKS
3M INTERAM E-54A MAT 24.5" X 20' ROLL	N/A	2	2		5470110376 0070713012	YES	YES	GOOD	NONE	YES			
3M INTERAM E-54A MAT 24.5" X 20' ROLL	N/A	6	6		5470617657 0073223012	YES	YES	GOOD	NONE	YES			
3M INTERAM E-54A MAT 24.5" X 20' ROLL	N/A	1	1		5470617659 0073223012	YES	YES	GOOD	NONE	YES			
3M INTERAM E-54A MAT 24.5" X 20' ROLL	N/A	3	3		5470617652 0073223012	YES	YES	GOOD	NONE	YES			
3M INTERAM E-54A MAT 24.5" X 20' ROLL	N/A	4	4		5470617656 0073223012	YES	YES	GOOD	NONE	YES			
3M INTERAM E-54A MAT 24.5" X 20' ROLL	N/A	1	1		5470417520 0072513011	YES	YES	GOOD	NONE	YES			
T-49 ALUM TAPE 4" X 60 YDS	N/A	3	3		7110-1-4	YES	YES	GOOD	NONE	YES			
T-49 ALUM TAPE 4" X 60 YDS	N/A	2	2		6150-4-5	YES	YES	GOOD	NONE	YES			
FIRE DAM 150 10.5 OZ TUBE	N/A	9	9		7661J7	YES	YES	GOOD	NONE	YES			
FIRE DAM 150 10.5 OZ TUBE	N/A	13	13		7657J7	YES	YES	GOOD	NONE	YES			
3M FIRE BARRIER 2000+	N/A	1	1		ETO47054	N/A	N/A	GOOD	NONE	YES			

WHITE - QC Job File Yellow - Purchasing Pink - Rec. Dept Gold - QC Numerical Control

Form QC-2000DB
Rev. 0 07

CONDUIT & BOX

FINAL INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *007* DATE: *3/12/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

PEAK SEALS REFERENCE DRAWINGS:	UTILITY REFERENCE DRAWINGS:	COMMENTS:
PSI-2009 SHT. 1 *PSI-2009 SHT. 2*		

REFERENCE QCP 2000DB PARAGRAPHS 6.11 & 6.12

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Proper Layer Count	Collars & Cover Strips	Taping Joints etc	Support Coverage	Heat T'fer Interfer.	Bands 12" max 1 per pc.	2 Bands min Collar	Bands At Termin.	Termin. Sealed	Penetrations Sealed
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
Complete 4" Conduit	START: All END:	☑ ☐	☑ ☐	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐	☑ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

REFERENCE QCP 2000DB PARAGRAPH 6.13

ITEM I.D.	DESCRIPTION OF REPAIRED AREA:	GAPS 1/8" TO ≤ 3/8" Tears & Gaps Taped	GAPS 1/8" TO ≤ 3/8" Gaps >1/8", ≤ 3/8" Caulked/ Taped	INNER LAYER PATCH ≤ 1/8" Gap	INNER LAYER PATCH Gaps Taped	OUTER LAYER PATCH 2" Min. Overlap	OUTER LAYER PATCH Overlaps Caulked & Taped	OUTER LAYER PATCH Proper Restraint
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: ① Termination 4" mat horizontal one end vertical other end.
Note: Shaded boxes indicate aspects which are not applicable

PEAK SEALS QUALITY CONTROL: [signature] DATE: 3/12/98 PAGE ___ OF ___

Form QC-2000DB
Rev. 0 07/

CONDUIT & BOX

FINAL INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *006* DATE: *3/17/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

PEAK SEALS REFERENCE DRAWINGS:	UTILITY REFERENCE DRAWINGS:	COMMENTS:
PSI-2009 SHT. 1 *PSI-2009 SHT. 2*		

REFERENCE QCP 2000DB PARAGRAPHS 6.11 & 6.12

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Proper Layer Count	Collars & Cover Strips	Taping Joints etc	Support Coverage	Heat T'fer Interfer.	Bands 12" max 1 per pc.	2 Bands min Collar	Bands At Termin.	Termin. Sealed	Penetrations Sealed
Complete 3-2"/3-4"	START: All END:	sat ✓ unsat ☐	sat ✓ unsat ☐	sat ✓ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ✓ unsat ☐	sat ✓ unsat ☐	sat ✓ unsat ☐	sat ✓ (1) unsat ☐	sat ☐ unsat ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

REFERENCE QCP 2000DB PARAGRAPH 6.13

ITEM I.D.	DESCRIPTION OF REPAIRED AREA:	GAPS 1/8" TO ≤ 3/8" Tears & Gaps Taped	GAPS 1/8" TO ≤ 3/8" Gaps >1/8", ≤ 3/8" Caulked/ Taped	INNER LAYER PATCH ≤ 1/8" Gap	INNER LAYER PATCH Gaps Taped	OUTER LAYER PATCH 2" Min. Overlap	OUTER LAYER PATCH Overlaps Caulked & Taped	OUTER LAYER PATCH Proper Restraint
	START: END:	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: (1) Mat w/ 2 collars abutted to test deck; opening grouted by laboratory.
Note: Shaded boxes indicate aspects which are not applicable

PEAK SEALS QUALITY CONTROL: [signature] DATE: 3/17/98 PAGE ___ OF ___

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Form QC-2000DB
Rev. 0 07/

CONDUIT & BOX

FINAL INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	PROJECT INFORMATION:	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *005* DATE: *3/17/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

PEAK SEALS REFERENCE DRAWINGS:	UTILITY REFERENCE DRAWINGS:	COMMENTS:
PSI-2009 SHT. 4		

REFERENCE QCP 2000DB PARAGRAPHS 6.11 & 6.12

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Proper Layer Count	Collars & Cover Strips	Taping Joints etc	Support Coverage	Heat T'fer Interfer.	Bands 12" max 1 per pc.	2 Bands min Collar	Bands At Termin.	Termin. Sealed	Penetrations Sealed
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
Complete Cond. Bank	START: All END:	☑ ☐	☑ ☐	☑ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐	☑ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

REFERENCE QCP 2000DB PARAGRAPH 6.13

ITEM I.D.	DESCRIPTION OF REPAIRED AREA:	GAPS 1/8" TO ≤ 3/8" Tears & Gaps Taped	GAPS 1/8" TO ≤ 3/8" Gaps >1/8", ≤ 3/8" Caulked/ Taped	INNER LAYER PATCH ≤ 1/8" Gap	INNER LAYER PATCH Gaps Taped	OUTER LAYER PATCH 2" Min. Overlap	OUTER LAYER PATCH Overlaps Caulked & Taped	OUTER LAYER PATCH Proper Restraint
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS:
Note: Shaded boxes indicate aspects which are not applicable

PEAK SEALS QUALITY CONTROL: [signature] DATE: 3/17/98 PAGE ___ OF ___

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Rev. 0 07/0

CONDUIT & BOX

FINAL INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *004* DATE: *3/16/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

PEAK SEALS REFERENCE DRAWINGS:	UTILITY REFERENCE DRAWINGS:	COMMENTS:
PSI-2009 SHT. 4		

REFERENCE QCP 2000DB PARAGRAPHS 6.11 & 6.12

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Proper Layer Count	Collars & Cover Strips	Taping Joints etc	Support Coverage	Heat T'fer Interfer.	Bands 12" max 1 per pc.	2 Bands min Collar	Bands At Termin.	Termin. Sealed	Penetrations Sealed
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
Complete Trapeze Sup	START: All END:	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

REFERENCE QCP 2000DB PARAGRAPH 6.13

ITEM I.D.	DESCRIPTION OF REPAIRED AREA:	GAPS 1/8" TO ≤ 3/8" Tears & Gaps Taped	GAPS 1/8" TO ≤ 3/8" Gaps >1/8", ≤ 3/8" Caulked/ Taped	INNER LAYER PATCH ≤ 1/8" Gap	INNER LAYER PATCH Gaps Taped	OUTER LAYER PATCH 2" Min. Overlap	OUTER LAYER PATCH Overlaps Caulked & Taped	OUTER LAYER PATCH Proper Restraint
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS:

Note: Shaded boxes indicate aspects which are not applicable

PEAK SEALS QUALITY CONTROL: _____ DATE: 3/16/98 PAGE ___ OF ___

CONDUIT & BOX

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Rev. 0 07/0

FINAL INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *003* DATE: *3/13/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

PEAK SEALS REFERENCE DRAWINGS:	UTILITY REFERENCE DRAWINGS:	COMMENTS:
PSI-2009 SHT. 6		

REFERENCE QCP 2000DB PARAGRAPHS 6.11 & 6.12

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Proper Layer Count	Collars & Cover Strips	Taping Joints etc	Support Coverage	Heat T'fer Interfer.	Bands 12" max 1 per pc.	2 Bands min Collar	Bands At Termin.	Termin. Sealed	Penetrations Sealed
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
Complete South 12x12 JB	START: All END:	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

REFERENCE QCP 2000DB PARAGRAPH 6.13

ITEM I.D.	DESCRIPTION OF REPAIRED AREA:	GAPS 1/8" TO ≤ 3/8" Tears & Gaps Taped	GAPS 1/8" TO ≤ 3/8" Gaps >1/8", ≤ 3/8" Caulked/ Taped	INNER LAYER PATCH ≤ 1/8" Gap	INNER LAYER PATCH Gaps Taped	OUTER LAYER PATCH 2" Min. Overlap	OUTER LAYER PATCH Overlaps Caulked & Taped	OUTER LAYER PATCH Proper Restraint
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS:

Note: Shaded boxes indicate aspects which are not applicable

PEAK SEALS QUALITY CONTROL: _____ DATE: 3/13/98 PAGE ___ OF ___

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CONDUIT & BOX

FINAL INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	PROJECT INFORMATION:	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *002* DATE: *3/11/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

PEAK SEALS REFERENCE DRAWINGS:	UTILITY REFERENCE DRAWINGS:	COMMENTS:
PSI-2009 SHT. 3		

REFERENCE QCP 2000DB PARAGRAPHS 6.11 & 6.12

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Proper Layer Count	Collars & Cover Strips	Taping Joints etc	Support Coverage	Heat T'fer Interfer.	Bands 12" max 1 per pc.	2 Bands min Collar	Bands At Termin.	Termin. Sealed	Penetrations Sealed
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
Complete North 12x12 JB	START: All ① END:	☑ ☐	☑ ☐	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☑ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

REFERENCE QCP 2000DB PARAGRAPH 6.13

ITEM I.D.	DESCRIPTION OF REPAIRED AREA:	GAPS 1/8" TO ≤ 3/8" Tears & Gaps Taped	GAPS 1/8" TO ≤ 3/8" Gaps >1/8", ≤ 3/8" Caulked/ Taped	INNER LAYER PATCH ≤ 1/8" Gap	INNER LAYER PATCH Gaps Taped	OUTER LAYER PATCH 2" Min. Overlap	OUTER LAYER PATCH Overlaps Caulked & Taped	OUTER LAYER PATCH Proper Restraint
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: ① Only top and bottom pieces had an outer layer butt joint; collared in this area only.
Note: Shaded boxes indicate aspects which are not applicable

PEAK SEALS QUALITY CONTROL: [signature] DATE: 3/11/98 PAGE ___ OF ___

CONDUIT & BOX

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Rev. 0 07/

FINAL INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *001* DATE: *3/11/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

PEAK SEALS REFERENCE DRAWINGS:	UTILITY REFERENCE DRAWINGS:	COMMENTS:
PSI-2009 SHT. 1 *PSI-2009 SHT. 2*		

REFERENCE QCP 2000DB PARAGRAPHS 6.11 & 6.12

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Proper Layer Count	Collars & Cover Strips	Taping Joints etc	Support Coverage	Heat T'fer Interfer.	Bands 12" max 1 per pc.	2 Bands min Collar	Bands At Termin.	Termin. Sealed	Penetrations Sealed
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
Complete 36 x 10 x 19 Box	START: All ① END:	✓ ☐	✓ ☐	✓ ☐	☐ ☐	☐ ☐	✓ ☐	✓ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

REFERENCE QCP 2000DB PARAGRAPH 6.13

ITEM I.D.	DESCRIPTION OF REPAIRED AREA:	GAPS 1/8" TO ≤ 3/8" Tears & Gaps Taped	GAPS 1/8" TO ≤ 3/8" Gaps >1/8", ≤ 3/8" Caulked/ Taped	INNER LAYER PATCH ≤ 1/8" Gap	INNER LAYER PATCH Gaps Taped	OUTER LAYER PATCH 2" Min. Overlap	OUTER LAYER PATCH Overlaps Caulked & Taped	OUTER LAYER PATCH Proper Restraint
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: ① Only top and bottom pieces had an outer layer butt joint; collared in this area only.

Note: Shaded boxes indicate aspects which are not applicable

PEAK SEALS QUALITY CONTROL: _____ DATE: _____ PAGE ___ OF ___

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CONDUIT & BOX

DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *022* DATE: *3/12/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Longitudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap 2" +1/2"-0"	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
4th Layer 4" Conduit	START: All ① END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
5th Layer 4" Conduit	START: All END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
	START END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: ① 4th and 5th layer material flared onto concrete & fastened at intervals between 5" & 21"

Note: Shaded boxes indicate aspects which are not applicable.

PEAK SEALS QUALITY CONTROL: _____ DATE: 3/12/98 PAGE ___ OF ___

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Rev. 0 07/

CONDUIT & BOX

DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *021* DATE: *3/11/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10									
		Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap 2" +1/2"-0"	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
1st Layer 4" Conduit	START: All ② END:	sat unsat ☑ ☐	sat unsat ☐ ☐	sat unsat ☐ ☐	sat unsat ☑ ☐	sat unsat ☐ ☐	sat unsat ☑ ☐	sat unsat ☐ ☐	sat unsat ☑ ☐	sat unsat ☑ ☐	sat unsat ☑ ☐
2nd Layer 4" Conduit	START: All ② END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
2nd Stand. 4" Conduit	START All ① ② END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
3rd Layer 4" Conduit	START: All END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: ① Spacer pieces applied at intervals not to exceed 15" and as necessary to maintain spacing
② 1st stand., 1st & 2nd layer & 2nd stand applied around conduit. Beginning with 3rd layer material flared onto slab & fastened at intervals between 5" & 21"

Note: Shaded boxes indicate aspects which are not applicable.

PEAK SEALS QUALITY CONTROL: [signature] DATE: 3/11/98 PAGE ___ OF ___

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CONDUIT & BOX

DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *020* DATE: *3/11/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION		REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10									
			Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap 2" +1/2"-0"	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
			sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
1st Stand 4" Conduit	START: All ①	END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
	START:	END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START:	END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START:	END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START:	END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START:	END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START:	END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START:	END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START:	END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START:	END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: ① Spacer pieces applied at intervals not to exceed 18" and as necessary to maintain spacing

Note: Shaded boxes indicate aspects which are not applicable.

PEAK SEALS QUALITY CONTROL: _____ DATE: 3/11/98 PAGE ___ OF ___

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CONDUIT & BOX

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Rev. 0 07/

DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *018* DATE: *3/16/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10									
		Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap 2" +1/2"-0"	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
4th Layer 3-4"/3-2"	START: All END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS:

Note: Shaded boxes indicate aspects which are not applicable.

PEAK SEALS QUALITY CONTROL: [signature] DATE: 3/16/98 PAGE ___ OF ___

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DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *017* DATE: *3/13/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10									
		Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap 2" +1/2"-0"	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
3rd Layer 3-4"/3-2"	START: All END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS:

Note: Shaded boxes indicate aspects which are not applicable.

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3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *016* DATE: *3/12/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap 2" +1/2"-0"	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
2nd Layer 3-4"/3-2"	START: All END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
2nd Stand 3-4"/3-2"	START: All ① END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
	START END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: ① Spacer pieces applied at intervals not to exceed 15" and as necessary to maintain spacing.

Note: Shaded boxes indicate aspects which are not applicable.

PEAK SEALS QUALITY CONTROL: [signature] DATE: 3/12/98 PAGE ___ OF ___

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DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *015* DATE: *3/11/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap 2" +1/2"-0"	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
1st Stand 3-4"/3-2"	START: All ① END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
1st Layer 3-4"/3-2"	START: All END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
	START END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: ① Spacer pieces applied at intervals not to exceed 15" and as necessary to maintain spacing.

Note: Shaded boxes indicate aspects which are not applicable.

PEAK SEALS QUALITY CONTROL: _____ DATE: 3/11/98 PAGE ___ OF ___

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DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *014* DATE: *3/17/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10									
		Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap Mat width	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
4th Layer Conduit Bank	START: All END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
5th Layer Conduit Bank	START: All END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
	START END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS:

Note: Shaded boxes indicate aspects which are not applicable.

PEAK SEALS QUALITY CONTROL: _____ **DATE:** 3/17/98 **PAGE** ___ **OF** ___

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DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *013* DATE: *3/16/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10									
		Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap Mat width	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
1st Layer Conduit Bank	START: Remainder, See 3/13 sheet END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
2nd Layer Conduit Bank	START: All END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
2nd Stand Conduit Bank	START: All END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
3rd Layer Conduit Bank	START: All END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: Standoffs used at intervals not to exceed 15" and as necessary to maintain spacing.

Note: Shaded boxes indicate aspects which are not applicable.

PEAK SEALS QUALITY CONTROL: _____ **DATE:** 3/16/98 **PAGE** ___ **OF** ___

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DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *012* DATE: *3/13/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10									
		Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap Mat width	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
1st Stand Conduit Bank	START: All END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
1st Layer Conduit Bank	START: End near 4" conduit END: 49" opposite LB;	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: Standoffs used at intervals not to exceed 15" and as necessary to maintain spacing.

Note: Shaded boxes indicate aspects which are not applicable.

PEAK SEALS QUALITY CONTROL: [signature] **DATE:** 3/13/98 **PAGE** ___ **OF** ___

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DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *011* DATE: *3/16/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap Mat width	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
3rd Layer Trapeze Sup.	START: All sides END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐
4th layer Trapeze Sup	START: All sides END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐
Collar 1 Trapeze Sup	START: ① END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐
Collar 2 Trapeze Sup.	START: ① END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: ① Four-piece method used for collar.

Shaded boxes indicate aspects which are not applicable.

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DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *010* DATE: *3/13/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10									
		Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap Mat width	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
1st Layer Trapeze Sup	START: All sides END:	sat unsat ☑ ☐	sat unsat ☐ ☐	sat unsat ☐ ☐	sat unsat ☑ ☐	sat unsat ☐ ☐	sat unsat ☑ ☐	sat unsat ☐ ☐	sat unsat ☑ ☐	sat unsat ☐ ☐	sat unsat ☑ ☐
2nd layer Trapeze Sup	START: All sides END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS:

Note: Shaded boxes indicate aspects which are not applicable

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DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. _____ ELEV. _____	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *009* DATE: *3/13/98*
AREA/ROOM: _____	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap Mat width	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
5th Layer South 12"x12"JB	START: All sides ② END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
6th layer South 12"x12"JB	START: All sides ① ② END:	☑ ☐	☐ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☐ ☐	☑ ☐	☑ ☐	☑ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: ① Fasteners 1 at each corner ; These fasteners impale final three layers (4th, 5th, & 6th) spacing between fasteners is 20" ±1"
② For each layer, A single piece was used to form a "U" shaped piece consisting of 2 flanges, 2 sides and bottom; remaining two sides overlap by mat width

Note: Shaded boxes indicate aspects which are not applicable.

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DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	PROJECT INFORMATION:	
BLDG. N/A ELEV. N/A	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *008* DATE: *3/12/98*
AREA/ROOM: N/A	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap Mat width	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
Spacer South 12"x12"JB	START: All sides ① END:	sat ☑ unsat ☐	sat N/A unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat ☑ unsat ☐	sat ☑ unsat ☐
3rd layer South 12"x12"JB	START: All sides END:	sat ☑ unsat ☐	sat N/A unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat ☑ unsat ☐	sat ☑ unsat ☐
4th layer South 12"x12"JB	START: All sides ②,③ END:	sat ☑ unsat ☐	sat N/A unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat ☑ unsat ☐	sat ☑ unsat ☐
	START: END:	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐
	START: END:	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐
	START: END:	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐
	START: END:	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐
	START: END:	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐
	START: END:	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐
	START: END:	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐	sat ☐ unsat ☐

COMMENTS: ① Spacer pieces applied at intervals not to exceed 15" and as necessary to maintain spacing.
② For each layer, A single piece was used to form a "U" shaped piece consisting of 2 flanges, 2 sides and bottom; remaining two sides overlap by mat width
③ Fasteners 1 at each corner ; This fastener impales this layer (4th); spacing between fasteners is 20" ±1"

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DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. N/A ELEV. N/A	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *007* DATE: *3/11/98*
AREA/ROOM: N/A	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

		REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10									
LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-ludinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap Mat width	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
1st Layer South 12"x12"JB	START: All sides END:	sat ☑ unsat ☐	sat N/A unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat ☑ unsat ☐	sat ☑ unsat ☐
2nd layer South 12"x12"JB	START: All sides END:	☑ ☐	N/A ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	☑ ☐	☑ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS:

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DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. N/A ELEV. N/A	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *006* DATE: *3/11/98*
AREA/ROOM: N/A	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10									
		Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap Mat width	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
5th Layer North 12"x12"JB	START: All sides END:	☑ ☐	☐ N/A	☐ N/A	☑ ☐	☐ N/A	☑ ☐	☐ N/A	☑ ☐	☑ ☐	☑ ☐
6th layer North 12"x12"JB	START: All sides ① END:	☑ ☐	N/A ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	N/A ☐	① ☑ ☐	☑ ☐	☑ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: ①Bottom piece overlapped onto sides by 3" to 3-1/2"

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DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. N/A ELEV. N/A	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *005* DATE: *3/10/98*
AREA/ROOM: N/A	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10									
		Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap Mat width	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
3rd Layer North 12"x12"JB	START: All sides END:	sat ☑ unsat ☐	sat N/A unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat ☑ unsat ☐	sat ☑ unsat ☐
4th layer North 12"x12"JB	START: All sides END:	☑ ☐	N/A ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	☑ ☐	☑ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS:

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DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. N/A ELEV. N/A	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *004* DATE: *3/9/98*
AREA/ROOM: N/A	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10									
		Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-ludinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap Mat width	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
1st Layer North 12"x12"JB	START: All sides ① END:	☑ ☐	N/A ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	☑ ☐	☑ ☐
2nd layer North 12"x12"JB	START: All sides① END:	☑ ☐	N/A ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	☑ ☐	☑ ☐
Spacer North 12"x12"JB	START: All sides ② END:	☑ ☐	N/A ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	☑ ☐	☑ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: ① FS-2000+ used to adhere all sides to junction box surface for first two layers.
② Spacer pieces applied at intervals not to exceed 15" and as necessary to maintain spacing.

PEAK SEALS QUALITY CONTROL: [signature] DATE: 3/9/98 PAGE ___ OF ___

CONDUIT & BOX

Form QC-2000.1DB
Rev. 0 07/

DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	PROJECT INFORMATION:	
BLDG. N/A ELEV. N/A	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *003* DATE: *3/11/98*
AREA/ROOM: N/A	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10									
		Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap +1"-0"	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
6th Layer 36 x 10 x 19 Box	START: All sides ① END:	sat ☑ unsat ☐	sat N/A unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat N/A unsat ☐	sat ☑ unsat ☐	sat N/A unsat ☐	sat ① ☑ unsat ☐	sat ☑ unsat ☐	sat ☑ unsat ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: ① Bottom & top pieces overlapped onto sides 3"-4" last layer side pieces applied over this overlap.

PEAK SEALS QUALITY CONTROL: [signature] DATE: 3/11/98 PAGE ___ OF ___

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CONDUIT & BOX

Form QC-2000.1DB
Rev. 0 07/

DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	PROJECT INFORMATION:	
BLDG. N/A ELEV. N/A	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *002* DATE: *3/10/98*
AREA/ROOM: N/A	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap Mat Width	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
3rd Layer 36 x 10 x 19 Box	START: All sides END:	☑ ☐	N/A ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	☑ ☐	☑ ☐
4th Layer 36 x 10 x 19 Box	START: All sides END:	☑ ☐	N/A ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	☑ ☐	☑ ☐
5th Layer 36 x 10 x 19 Box	START: All sides END:	☑ ☐	N/A ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	☑ ☐	☑ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS:

PEAK SEALS QUALITY CONTROL: [signature] DATE: 3/10/98 PAGE ___ OF ___

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CONDUIT & BOX

Form QC-2000 1DB
Rev. 0 07/

DAILY INSPECTION REPORT
3M INTERAM™ THREE HOUR FIRE PROTECTIVE SYSTEM

WORK LOCATION:	*PROJECT INFORMATION:*	
BLDG. N/A ELEV. N/A	PROJECT NAME: *Corporate Test Procedure CTP-2009*	REPORT NO. *001* DATE: *3/9/98*
AREA/ROOM: N/A	PROJECT LOCATION: *Omega Point Laboratories*	PROJECT NO. *8610-102570*

REFERENCE QCP 2000DB PARAGRAPHS 6.9 & 6.10

LAYER/ ITEM I.D.	DESCRIPTION OF APPLICATION	Adequate Cleanliness	12" Marking Heat T'fer Interfer.	Cable Drop Transition	Layer I.D.	Long-tudinal Overlap	Perimeter Joints Caulked & Taped-	2 Piece Joints Caulked & Taped-	4 piece Overlap + Mat Width	Butt Joints Caulked ≥1/8 ≤3/8"	Butt Joint Gaps ≤3/8"
		sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat	sat unsat
1st Layer 36 x 10 x 19 Box	START: All sides END:	☑ ☐	N/A ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	☑ ☐	☑ ☐
2nd layer 36 x 10 x 19 Box	START: All sides END:	☑ ☐	N/A ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	N/A ☐	☑ ☐	☑ ☐	☑ ☐
Spacer 36 x 10 x 19 Box	START: All sides ① END:	N/A ☐	N/A ☐	N/A ☐	N/A ☐	N/A ☐	N/A ☐	N/A ☐	N/A ☐	N/A ☐	N/A ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐
	START: END:	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐

COMMENTS: ①Spacer pieces applied at intervals not to exceed 15" and as necessary to maintain spacing.

PEAK SEALS QUALITY CONTROL: [signature] DATE: 3/9/98 PAGE ___ OF ___

Form QA-18A
02/04/87

QUALITY ASSURANCE TRAINING RECORD
(ON-THE-JOB)

NAME: ROB MALLU

PAGE: 1 OF 1

DESCRIPTION OF TRAINING ACTIVITIES	TRAINED BY	DATE
Test Plan # CTP-2009 THREE HOUR FIRE ENDURANCE TEST 3M INTERAM™ FIRE WRAP	[illegible]	3/9/98

Form QA-18A
02/04/87

QUALITY ASSURANCE TRAINING RECORD
(ON-THE-JOB)

NAME: DON BAGBY

PAGE: 1 OF 1

DESCRIPTION OF TRAINING ACTIVITIES	TRAINED BY	DATE
Test Plan # CTP-2009 THREE HOUR FIRE ENDURANCE TEST 3M INTERAM™ FIRE WRAP	DBM	3/9/98

Form QA-18A
02/04/87

QUALITY ASSURANCE TRAINING RECORD
(ON-THE-JOB)

NAME: FRANK HAESE

PAGE: 1 OF 1

DESCRIPTION OF TRAINING ACTIVITIES	TRAINED BY	DATE
Test Plan # CTP-2009 THREE HOUR FIRE ENDURANCE TEST 3M INTERAM™ FIRE WRAP	[illegible]	3/9/98

Event Log

OMEGA POINT LABORATORIES

EVENT LOG

PROMATEC, INC.

Client # 8610

Project #102570

Omega Point Laboratories, Inc.
16015 Shady Falls Road
Elmendorf, Texas 78112-9784
210-635-8100 / FAX: 210-635-8101 / 800-966-5253
www.opl.com / e-mail: moreinfo@opl.com

EVENT LOG

PROMATEC TECHNOLOGIES, INC.

Client # 8610

NOTE:
This Log is used to document the dates and note each step during the completion of the test project referenced below. The assigned Omega Point Laboratories' project number and brief description of this test assembly are:

Proj. No. 102570: Three Hour Fire Resistance Test of a horizontal slab containing various insulated conduit and junction box systems.

ITEM	DATE	INIT'L
Proposal no. P980108-01 for three hour fire resistance test to Promatec Technologies.	1/8/98	CH
Purchase Order no. 2116 dated 1/09/98 is faxed to Omega Point.	1/12/98	CH
Materials rec'd from Promatec.	1/13/98	CH
by QA/QC personnel.	1/14	CH
Fabrication of the steel frame for the concrete slab begins by OPL technicians.	1/14	CH
Frame dimensions and blockouts are verified by OPL QA/QC personnel.	1/15	CH
Concrete is poured into the test frame by OPL technicians.	1/20	CH
OPL QA/QC personnel order test article materials.	1/20	CH
Concrete slab curing begins with the slab placed on the large furnace by OPL technicians.	1/20	CH
Test article materials are received by OPL QA/QC personnel.	1/23	CH
Test plan no CTP-2008 is received by fax from Promatec.	1/23	CH
OPL technicians began assembling test article materials.	1/23	CH
OPL technicians remove test slab from furnace.	1/27/98	S
OPL technicians continue to assemble test article.	1/28/98	S
	1/30/98	S

EVENT LOG

PROMATEC TECHNOLOGIES, INC.
Client # 8610

NOTE:
This Log is used to document the dates and note each step during the completion of the test project referenced below. The assigned Omega Point Laboratories' project number and brief description of this test assembly are:

Proj. No. 102570: Three Hour Fire Resistance Test of a horizontal slab containing various insulated conduit and junction box systems.

ITEM	DATE	INIT'L
Mike Murphy of Promatec Technologies, Inc call and put the project on hold.	1/30/98	g
Mike Murphy of Promatec (PCI) call to reinstate the project	2/20/98	g
OPL QA/QC called to purchase another JB. Thermocouples are being installed on the test assembly. CH 2/27/98	2/25/98	g
The additional junction box is received by OPL QA/QC personnel.	2/27	CH
OPL technicians continue construction of the test assembly with the addition of the new junction box and completion of conduit supports.	3/2	CH
Work continues on the installation of the test assembly thermocouples.	3/3	CH
The test assembly fabrication is completed by OPL technicians.	3/5	CH
OPL QA/QC personnel begin verification of the test assembly hardware dimensions and thermocouple placement.	3/5	CH
OPL QA/QC personnel continue verification of test assembly thermocouples.	3/6	CH
Promatec Technologies personnel arrive at OPL to begin installation procedures. The following	3/9/98	CH
personnel will be involved in	3/9/98	CH

EVENT LOG

PROMATEC TECHNOLOGIES, INC.
Client # 8610

NOTE:
This Log is used to document the dates and note each step during the completion of the test project referenced below. The assigned Omega Point Laboratories' project number and brief description of this test assembly are:

Proj. No. 102570: Three Hour Fire Resistance Test of a horizontal slab containing various insulated conduit and junction box systems.

ITEM	DATE	INIT'L
this project:	3/9/98	CH
Mike Murphy Project Mgr.		
Don Bagby Insulator		
Bernard Haese "		
Rob Robinson from Toledo Edison	3/9	CH
arrives to provide utility		
quality control services (am).		
Conduits 10 11, and 12 are tack	3/9	CH
welded to the support per		
Promatec instructions by OPL		
technicians. The placement is		
verified by OPL QA/QC.		
Application of the insulation	3/9	CH
begins by Promatec insulators.		
Insulation begins with cover-	3/9	CH
age on junction boxes.		
Second and third layers of	3/10	CH
the 3M Interam Fire Wrap are		
applied to JB #1. The 3M Fire		
Barrier 2000+ material is used		
under the first two layers of the		
3M Fire Wrap to adhere it to the		
junction box on junction box		
#2 only.		
Junction box #3 has all six	3/10	CH
layers of 3M Fire wrap applied.		
Junction box #2 has six		
layers of 3M Fire Wrap insula-		
tion applied.		
Conduit #9 insulation is	3/10/98	CH
started by Promatec technicians	3/10	CH

EVENT LOG

PROMATEC TECHNOLOGIES, INC.
Client # 8610

NOTE:
This Log is used to document the dates and note each step during the completion of the test project referenced below. The assigned Omega Point Laboratories' project number and brief description of this test assembly are:

Proj. No. 102570: Three Hour Fire Resistance Test of a horizontal slab containing various insulated conduit and junction box systems.

ITEM	DATE	INIT'L
Began wrap of the conduits going through junction box #3.	3/11/98	CH
3M Fire Wrap of junction #2 is completed by Promatec technicians. Conduit #9 insulation continues.		
Insulation continues on the multi-conduit wrap, conduit #9 and junction box #1.	3/12	CH
Rob Robinson, Toledo Edison Quality Assurance Inspector departs.	3/12	CH
Conduit #9 wrap is completed. One section is fastened in a 26" wide section of 1/2" welded wire mesh. Junction box #1 is completed. Insulation wrap on the trapeze hangers begin.	3/13	CH
Mike Murphy departs late last afternoon. Installers depart for weekend.	3/13	CH
Mike Murphy arrives with the installers arrive at Omega Point.	3/16	CH
Andy Migas, Senior Engineer at Toledo Edison arrives at Omega Point.	3/16	CH
The Promatec installers continue work on the test assembly.	3/16	CH
Installers complete the insulation of the test assembly and	3/17	CH
	3/17/98	CH

EVENT LOG

PROMATEC TECHNOLOGIES, INC.
Client # 8610

NOTE:
This Log is used to document the dates and note each step during the completion of the test project referenced below. The assigned Omega Point Laboratories' project number and brief description of this test assembly are:

Proj. No. 102570: Three Hour Fire Resistance Test of a horizontal slab containing various insulated conduit and junction box systems.

ITEM	DATE	INIT'L
depart Omega Point Labs.	3/17/98	CH
OPL technicians move the test assembly to the test furnace and attach the thermocouples to the data acquisition equipment.		
Deg Priest, OPL Project manager, performs the pre test checklist	3/19	CH
The fire test of project 102570 begins at 1:32 pm and is witnessed by:	3/19	CH
Deg Priest Omega Point Labs	3/19	CH
Andy Mizas Toledo Edison		
Kerry Hitchcock OPL		
Richard Beasley "		
Oscar Estrada "		
Cleda Patton "		
Mike Murphy Promatec		
The fire test is followed by the hose stream test uses a 30° spray fog nozzle with 75 psi from a distance of 5 feet for 5 minutes. The pressure gage used is OPL equipment #92LE002 with calibration due on 2/2/99.	3/19	CH
	3/19/98	CH
Tear down and inspection of project 102570 was completed by Deg Priest.	5-11-98	8
— END —	5-11-98	8

Certifications of Calibration and Conformance

OMEGA POINT LABORATORIES

Q/A RECEIVING REPORT

OMEGA POINT LABORATORIES

CLIENT/PROJECT NAME Promatec
CLIENT/PROJECT NUMBER 8610-102570
RECEIVED FROM Graybar
PROJECT LOCATION Omega Point Labs

REPORT NUMBER 1752 . 8610
DATE RECEIVED 2-27-98
DATE INSPECTED 2-27-98
INSPECTED BY: C Sato

ITEM DESCRIPTION	P.O. NO.	QUANTITY Order	QUANTITY Rec'd	QUANTITY B.O.	I.D. NO.	COND MATL Y/N	CERT. RECD Y/N	CONTAINER INTEGRITY	EXCEPTIONS	ACCEPTANCE Accept	ACCEPTANCE Hold	ACCEPTANCE Reject	REMARKS
12"x12"x8" Junction box	11106Q	2	1	Ø	12x12x8" N12 Box Elect P	Y	Y	Good	None	X			

09-016-9/97

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OMEGA POINT LABORATORIES
16015 SHADY FALLS RD.
ELMENDORF, TEXAS 78112
PH. (210) 635-8100

PURCHASE ORDER

11106Q

374

Date: 2/25/98

Page: 1

Project # 102570 PROMATEC

Order From:	Deliver to:
Graybar Electric Co. P.O. Box 8258 San Antonio TX 78208 (000) 000-0000 Ext. 0000	Omega Point Laboratories 16015 Shady Falls Rd. Elmendorf TX 78112 (210) 635-8100 Ext. 0000

Vendor #: 0166

Your Item Number Item Description	Our Reference	Qty Ordered	Units	Unit Cost	Extension
12"X12"X8" 14 Gauge Junction Box	001	1.00	Each	$56.00	$56.00

"See Special Instructions Regarding Purchasing Specifications for Quality Assurance Requirements."
QA Approval C Dalton
Date 2-25-98

Please Quote Purchase Order Number on all correspondence.

Special instructions:
Please include Certificate of Compliance to applicable standards and specifications

Subtotal:	$56.00
Freight:	$0.00
Tax amount:	$0.00
Total Value:	$56.00

080625/11-89

DATE 02/26/98 07:53 OUR REFERENCE NO. OM1EM111060 X

RETURN REQUESTED

GraybaR

(SATX)
(SATX)

INVOICE NO. 127-480841

FROM GraybaR 1223 N. HACKBERRY STREET SAN ANTONIO TX 78202

YOUR ORDER NO. 111060

SOLD TO
OMEGA POINT LABORATORIES
16015 SHADY FALLS RD.
ELMENDORF, TX 78112

SHIP TO
OMEGA POINT LABORATORIES
16015 SHADY FALLS RD.
ELMENDORF TX 78112

2/27/98

SCHED.	DATE SHIPPED AND ROUTING	F.O.B	RECEIPTS	PKG LISTS	SELECTED	CHECKED	PACKED
6A	~~02/26/98~~ GRAYBAR TRUCK - AM (T)	S/P-F/A	D,L	1			

QUANTITY SHIPPED	CATALOG # / DESCRIPTION	QUANTITY ORDERED	QUANTITY BACKORDERED
	ORDER SHIPPED COMPLETE		
1	12X12X8" N12 BOX ELECTRICAL P	1	

NUMBER		COMMODITY	POUN
1	BOXES		
	PIECES		
	BUNDLES		
	REELS		
	COILS		

SHIPPING CHARGES:

M _____ T _____

RECEIVED BY: Donald Rope

THE ABOVE MATERIAL IS BEING PURCHASED FOR AND WILL BE INCORPORATED IN THE _____ JOB. SIGNED _____ AGENT DATE 2-27-98

PACKING SLIP/LABEL COPY

GBRSF5OS 11/95

GraybaR

P O BOX 8258
SAN ANTONIO, TX 78208

W. M. HOLCOMB
Branch Manager
Phone 210-227-9241
Fax 210-227-5185

Omega Point Laboratories
16015 Shady Falls Rd.
Elmendorf, TX 78112

Reference P.O.# 11106Q

Gentleman:

We hereby certify that the items supplied on this order conform to applicable standards and specifications.

Quality Control Representative

1223 N. HACKBERRY STREET, SAN ANTONIO, TEXAS 78202

Q/A RECEIVING REPORT

OMEGA POINT LABORATORIES

CLIENT/PROJECT NAME Promatec
CLIENT/PROJECT NUMBER 8610-102570
RECEIVED FROM Graybar
PROJECT LOCATION Omega Point Labs

REPORT NUMBER 1733 - 8610
DATE RECEIVED 1-23-97
DATE INSPECTED 1-23-97
INSPECTED BY: Cotton

ITEM DESCRIPTION	P.O. NO.	QUANTITY Order	QUANTITY Rec'd	QUANTITY B.O.	I.D. NO.	COND MATL Y/N	CERT. RECD Y/N	CONTAINER INTEGRITY	EXCEPTIONS	ACCEPTANCE Accept	ACCEPTANCE Hold	ACCEPTANCE Reject	REMARKS
4" galv elbows	11035Q	6	6	Ø	4-GALV-ELL	Y		GOOD	None	X			Receiving verification only
2" galv. elbows	11035Q	6	6	Ø	2-GALV-ELL	Y		Good	None	X			
4" galv conduit	11035Q	50'	50'	Ø	4-GALV	Y		Good	None	X			
2" galv conduit	11035Q	50'	50'	Ø	2-GALV	Y		Good	None	X			
1" galv conduit	11035Q	20'	20'	Ø	1-GALV	X		Good	None	X			
14ga. 13"X19"X10" JB	11035Q	1	1	Ø	36X19X10	Y		Good	None	X			
14ga 12"X12"X8" JB	11035Q	1	1	Ø	12X12X8	Y		Good	None	X			
1" LB Body	11035Q	1	1	Ø	LB37	Y		Good	None	X			
1" LB Body cover	11035Q	1	1	Ø	370	X		Good	None	X			
1" NEO Body gasket	11035Q	1	1	Ø	GASK573	X		Good	None	X			
2" Locknuts	11035Q	6	6	Ø	BF6106	X		Good	None	X			

09-016-9/97

PURCHASE ORDER

Omega Point Laboratories, Inc.

16015 Shady Falls Road, Elmendorf, TX 78112-9784
(210) 635-8100 FAX: (210) 635-8101

378

Vendor: graybar

PO Number: 110350

Invoice, correspondence, all shipping papers, and packages must reference P.O. number.

Bill To:
Accounts Payable
Omega Point Laboratories, Inc.
16015 Shady Falls Road
Elmendorf, TX 78112-9784

Ship To:
Omega Point Laboratories, Inc.
16015 Shady Falls Road
Elmendorf, TX 78112-9784

Order Date	Ship Via	F.O.B.	Date Required	Terms
1-20-98				

Item No.	Description	Quantity Ordered	Unit Price	Extended Amount
1	4" 90° elbow	6	43 69	262.14
2	2" 90° elbow	6	9 16	54.96
3	4" conduit sections	50'	6.82	341.00
4	2" conduit sections	50'	2.27	113.50
5	1" conduit sections	20'	1.09	21.80
6	Junction box 36"X19"X10" 14ga steel	1	296 09	296.09
7	Junction box 12"X12"X8" 14ga steel	1	55 60	55.60

"See Special Instructions Regarding Purchasing Specifications for Quality Assurance Requirements."
PM Approval C. Patton
Date 1-20-98

POSTED

FEB - 9 1998
20391

Special Instructions

Ordered By: CP
Project #: 102570
Promatec

Total	1,145.09
Shipping	
Tax	
Invoice Total	

Special Instructions:
Please include Certificate of Compliance to applicable standards and specifications

DATE 01/21/98 15:26 OUR REFERENCE NO. OM1FM110350 X

RETURN REQUESTED

GraybaR (SATX) (SATX)

INVOICE NO. 127-475347

FROM GraybaR 1223 N. HACKBERRY STREET SAN ANTONIO TX 78202

YOUR ORDER NO. 110350

SOLD TO: SOMEGA POINT LABORATORIES 16015 SHADY FALLS RD. ELMENDORF, TX 78112

SHIP TO: SOMEGA POINT LABORATORIES 16015 SHADY FALLS RD. ELMENDORF TX 78112

1/23/98

SCHED.	DATE SHIPPED AND ROUTING	F.O.B.	RECEIPTS	PKG. LISTS	SELECTED	CHECKED	PACKED
6P	~~01/22/98~~ GRAYBAR TRUCK-PM (T)	S/P-F/A		1			

	QUANTITY SHIPPED	CATALOG # / DESCRIPTION	QUANTITY ORDERED	QUANTITY BACKORDERED
		ORDER SHIPPED COMPLETE		
X	1	36 X 19 X 10 MISC ENCLOSURE PER YOUR SPECS	1	
X	1	12 X 12 X 8 MISC ENCLOSURE PER YOUR SPECS	1	

NUMBER		COMMODITY	POUND
	BOXES		
2	PIECES		
	BUNDLES		
	REELS		
	COILS		

SHIPPING CHARGES:

M _____ T _____

[redacted]

RECEIVED BY: _____

THE ABOVE MATERIAL IS BEING PURCHASED FOR AND WILL BE INCORPORATED IN THE _____ JOB. SIGNED _____ AGENT DATE _____

PACKING SLIP/LABEL COPY

GBRSF5OS 11/95

SF50S

DATE 01/23/98 02:35 OUR REFERENCE NO. OM1EM110350056461 X

RETURN REQUESTED

GraybaR (SATX) (SATX)

INVOICE NO. 127-475610

FROM GraybaR 1223 N. HACKBERRY STREET SAN ANTONIO TX 78202

YOUR ORDER NO. 110350

SOLD TO
SOMEGA POINT LABORATORIES
16015 SHADY FALLS RD.
ELMENDORF TX 78112

SHIP TO
SOMEGA POINT LABORATORIES
16015 SHADY FALLS RD.
ELMENDORF TX 78112

SCHED.	DATE SHIPPED AND ROUTING	F.O.B.	RECEIPTS	PKG. LISTS	SELECTED	CHECKED	PACKED
AP	01/23/98 GRAYBAR TRUCK-PM (T)	S/P-F/A		1	MR		

	QUANTITY SHIPPED	CATALOG # / DESCRIPTION	QUANTITY ORDERED	QUANTITY BACKORDERED
TU122	6	4-GALV-ELL CONDUIT 90 DEG RIGID ELBOW	6	
AH	6	2-GALV-ELL CONDUIT 90 DEG RIGID ELBOW WHSE LOC:F10F3	6	
AH	50	4-GALV CONDUIT RIGID CONDUIT WHSE LOC:Q01A1	50	
AH	50	2-GALV CONDUIT RIGID CONDUIT WHSE LOC:Q01E1	50	
AH	20	1-GALV CONDUIT RIGID CONDUIT WHSE LOC:Q01H1	20	
		ITEMS MARKED # ARE TAXABLE		
127				

NUMBER		COMMODITY	POUND
1	BOXES		
6	PIECES		
1	BUNDLES		
	REELS		
	COILS		

SHIPPING CHARGES:

M _____ T _____

RECEIVED BY: _____

THE ABOVE MATERIAL IS BEING PURCHASED FOR AND WILL BE INCORPORATED IN THE _____ JOB. SIGNED _____ AGENT DATE _____

PACKING SLIP/LABEL COPY

GBRSF50S 11/95

DATE 01/29/98 OUR REFERENCE NO. OMIEM110350061543 X
12:05

RETURN REQUESTED

GraybaR

(SATX)
(SATX)

INVOICE NO. 127-476800

FROM GraybaR 1223 N. HACKBERRY STREET
SAN ANTONIO TX 78202

YOUR ORDER NO.
110350

SOLD TO
OMEGA POINT LABORATORIES
16015 SHADY FALLS RD.
ELMENDORF, TX 78112

SHIP TO
OMEGA POINT LABORATORIES
WILL CALL

SCHED.	DATE SHIPPED AND ROUTING	F.O.B.	RECEIPTS	PKG. LISTS	SELECTED	CHECKED	PACKED
8IC	01/30/98 COUNTER-PICKUP T/S-9	S/P-F/A		1			

QUANTITY SHIPPED	CATALOG # / DESCRIPTION	QUANTITY ORDERED	QUANTITY BACKORDERED
	ORDER SHIPPED COMPLETE		
1	LB37 CRH CONSTR 1-IN LB CONDUIT BODY WHSE LOC:R15E6	2	
1	370 CRH CONSTR 1-IN STL COND BODY COVER WHSE LOC:R15F7	2	
1	GASK373 CRH CONSTR 1-IN NEO BODY GASKET WHSE LOC:R15E5	2	
6	BFG 1CK		

NUMBER		COMMODITY	POUND
	BOXES		
	PIECES		
	BUNDLES		
	REELS		
	COILS		

SHIPPING CHARGES:
M _____ T _____

RECEIVED BY: _____

THE ABOVE MATERIAL IS BEING PURCHASED FOR AND WILL BE INCORPORATED IN THE _____ JOB. SIGNED _____ AGENT DATE _____

PACKING SLIP/LABEL COPY

GBRSF5OS 11/95

GraybaR

P. O. BOX 8258
SAN ANTONIO, TX 78208

W. M. HOLCOMB
Branch Manager
Phone 210-227-9211
Fax 210-227-5185

Omega Point Laboratories
16015 Shady Falls Rd.
Elmendorf, TX 78112

Reference P.O.# 11035Q

Gentleman:

We hereby certify that the items supplied on this order conform to applicable standards and specifications.

Quality Control Representative

1223 N. HACKBERRY STREET, SAN ANTONIO, TEXAS 78202

Q/A RECEIVING REPORT

OMEGA POINT LABORATORIES

CLIENT/PROJECT NAME Promatec
CLIENT/PROJECT NUMBER 8610-102570
RECEIVED FROM Promatec
PROJECT LOCATION Omega Point Labs

REPORT NUMBER 1732 - 8610
DATE RECEIVED 1-14-98
DATE INSPECTED 1-14-98
INSPECTED BY: C. Patton

ITEM DESCRIPTION	P.O. NO.	QUANTITY Order	QUANTITY Rec'd	QUANTITY B.O.	I.D. NO.	COND MATL Y/N	CERT. REC'D Y/N	CONTAINER INTEGRITY	EXCEPTIONS	ACCEPTANCE Accept	ACCEPTANCE Hold	ACCEPTANCE Reject	REMARKS
3m Interam E54 A mat	NA	Ø	12	Ø	5470617656 0073223012	Y	Y	Good	None	X			Receiving verification only
"	NA	Ø	12	Ø	5470617652 0073223012	Y	Y	Good	None	X			
"	NA	Ø	8	Ø	5470417520 0072513011	Y	Y	Good	None	X			
"	NA	Ø	6	Ø	5470417534 0071713011	Y	Y	Good	None	X			
"	NA	Ø	2	Ø	5470417417 0071713011	Y	Y	Good	None	X			
"	NA	Ø	7	Ø	5470617657 0073223012	Y	Y	Good	None	X			
"	NA	Ø	3	Ø	5470617659 0073223012	Y	Y	Good	None	X			
3m Firedam 150 Caulk	NA	Ø	12	Ø	776IJ7	Y	Y	Good	None	X			
"	NA	Ø	24	Ø	766IJ7	Y	Y	Good	None	X			
"	NA	Ø	7	Ø	765IJ7	Y	Y	Good	None	X			
3m T A9 Tape	NA	Ø	38	Ø	7110-1-4	Y	Y	Good	None	X			

09-016-9/97

384

PROMATEC®
TECHNOLOGIES, INC.

CERTIFICATE OF CONFORMANCE

REVISED

CERTIFICATION NUMBER: 0099/6228

CERTIFICATION DATE: 01/12/98

REVISION DATE: 01/21/98

CUSTOMER: PROMATEC TECHNOLOGIES, INC.
c/o OMEGA POINT LAB
16015 SHADY FALLS ROAD
ELMENDORF, TX 78112

PRODUCT: 3M INTERAM E-54A MAT

CUSTOMER ORDER NUMBER: CTP-2009

VENDOR: PROMATEC

CUSTOMER SPECIFICATION NUMBER: N/A

QUANTITY: 50 ROLLS

EXPIRATION DATE: N/A

IDENTIFICATION NUMBER:
5470417534/0071713011 – 6 ROLLS ✓
5470617652/0073223012 – 12 ROLLS ✓
5470417520/0072513011 – 8 ROLLS ✓
5470617657/0073223012 – 7 ROLLS ✓
5470617659/0073223012 – 3 ROLL ✓
5470617656/0073223012 – 12 ROLLS ✓
5470417417/0071713011 – 2 ROLLS ✓

CERTIFICATION REQUIREMENTS:

We hereby certify that all items furnished herein meet the requirements of the applicable product specifications, the above referenced customer order number, and supporting specifications. Vendor material certifications are on file and available upon written request.

Shelf Life – Not applicable to this item.

QUALITY ASSURANCE DEPT.
DORCAS SMITHWICK
QUALITY ADMINISTRATOR

P.O. BOX 309 • CYPRESS, TEXAS 77410-0309
(281) 373-4040 • FAX (281) 256-2694

PROMATEC®
TECHNOLOGIES, INC.

CERTIFICATE OF CONFORMANCE

REVISED

CERTIFICATION NUMBER:	0099/6229	CERTIFICATION DATE:	01/12/98
		REVISION DATE:	01/21/98
CUSTOMER:	PROMATEC TECHNOLOGIES, INC. c/o OMEGA POINT LAB 16015 SHADY FALLS ROAD ELMENDORF, TX 78112	PRODUCT:	3M FIREDAM 150 CAULK
CUSTOMER ORDER NUMBER:	CTP-2009	VENDOR:	PROMATEC
CUSTOMER SPECIFICATION NUMBER:	N/A	QUANTITY:	43 TUBES
IDENTIFICATION NUMBER:	12 TUBES @ 7761J7 24 TUBES @ 7661J7 7 TUBES @ 7657J7	EXPIRATION DATE:	31 JAN 1999

CERTIFICATION REQUIREMENTS:

We hereby certify that all items furnished herein meet the requirements of the applicable product specifications, the above referenced customer order number, and supporting specifications. Vendor material certifications are on file and available upon written request.

Shelf Life – Twelve (12) months from date of certification, last day of the month.

QUALITY ASSURANCE DEPT.
DORCAS SMITHWICK
QUALITY ADMINISTRATOR

PROMATEC®

TECHNOLOGIES, INC.

CERTIFICATE OF COMPLIANCE

CERTIFICATION NUMBER:	0099/6239	CERTIFICATION DATE:	01/21/98
CUSTOMER:	PROMATEC TECHNOLOGIES, INC. c/o OMEGA POINT LAB 16015 SHADY FALLS ROAD ELMENDORF, TX 78112	PRODUCT:	3M T-49 TAPE
CUSTOMER ORDER NUMBER:	CTP-2009	VENDOR:	PROMATEC
CUSTOMER SPECIFICATION NUMBER:	N/A	QUANTITY:	38 ROLLS
IDENTIFICATION NUMBER:	7110-1-4	EXPIRATION DATE:	N/A

CERTIFICATION REQUIREMENTS:

We hereby certify that all items furnished herein meet the requirements of the applicable product specifications, the above referenced customer order number, and supporting specifications. Vendor material certifications are attached.

Shelf Life – Not applicable to this item.

QUALITY ASSURANCE DEPT.
DORCAS SMITHWICK
QUALITY ADMINISTRATOR

P.O. BOX 309 • CYPRESS, TEXAS 77410-0309
(281) 373-4040 • FAX (281) 256-2694

PROMATEC TECHNOLOGIES, INC.
15926 CYPRESS N. HOUSTON
P. O. BOX 309 SUITE 150
CYPRESS, TX 77429

0099-M
PROMATEC TECHNOLOGIES, INC.
C/O OMEGA POINT LAB
16015 SHADY FALLS ROAD
ELMENDORF TX 78112-9784

Ship To/Remarks
PROMATEC TECHNOLOGIES, INC.
C/O OMEGA POINT LABORATORIES,
16015 SHADY FALLS ROAD
ELMENDORF TX 78112-9784

01/12/98 1282 1 02/11/98

CENTRAL FREIGHT SP/PREPAID 0/ 0/ N30 CTP-2009 1282

PROMATEC'S PACKING LIST #1282

SHIPPED VIA CENTRAL FREIGHT ON 01-12-98

✓ITEM 1)	S/S BANDING 1/2" X 0.020"; 4 RLS @ 200' PER ROLL	4.0	4.0
✓ITEM 2)	1/2" BAND CLIPS	100.0	100.0
✓ITEM 3)	INTERAM E54A MAT	50.0	50.0
✓ITEM 4)	T-49 TAPE	38.0	0.0
		Backordered	38.0 ✓ Rec. 1/20/98
	THIS ITEM TO SHIP DIRECT FROM 3M COMPANY		
✓ITEM 5)	FIREDAM 150 CAULK	43.0	43.0
✓ITEM 6)	18 GA S/S TIE WIRE	1.0	1.0
✓ITEM 7)	3/4" FILAMENT TAPE	66.0	66.0

CERTIFICATE OF CONFORMANCE (INCLUDED)

MATERIAL SAFETY DATA SHEET (INCLUDED)

3M General Offices

3M Center
St. Paul, MN 55144-1000
612 733 1110

3M

* * * * * * * * *

* CERTIFICATE OF CONFORMANCE *

* * * * * * * * *

DESCRIPTION: **Interam™ T-49 Tape**

This material is classified by Underwriters Laboratories as an Electrical Circuit Protective Material for use in electrical circuit protective systems #2, 3, 4, 6, 7, and 8 for a one (1) hour rating, and systems #6, 7, and 8 for a three (3) hour fire rating. This material is classified by Underwriters Laboratories as part of the structural steel protective system #X204 in the Fire Resistance Directory.

This product was tested according to:
ASTM E119 Fire Tests Of Building Construction and Materials.

This product is tested according to 3M Standard Number GP-17 and meets product requirements.

Pallet Serial No. S222

Customer P.O. No. 2113 ref: CTP-2009

Invoice No. ZR17922

Lot No. 7110-1-4

3M Part No. 980400-0172-3

Quantity 38 rolls

SM Hackney
Quality Manager or designee

01-14-98
Date

RCL/Std-COC/2-1-93

DELIVERY RECEIPT 01/12/98

HTN 147 KMO C1SAY113

FREIGHT BILL # XXXXXXXXCFL#99002067-9

SHIPPER 3600 0 BT

PROMATEC

15926 CYPRESS N. HOUSTON

SUITE 150

CYPRESS TX 77429

20 7713675

Central Freight Lines, Inc.

CORPORATE HEADQUARTERS P.O. BOX 2638 WACO, TX 76702-2638 PHONE (254) 772-2120

SCAC=CENF

CUSTOMER COPY

ROUTING 0451658004 FB# 990020679 IL

CONSIGNEE 6600

PROMATIC TECHNOLOGIES INC

16015 SHADY FALLS RD

% OMEGA POINT LABRATORIES

ELMENDORF TX 78112

REF. #

BL CTP2009

PO# 2116

0000000000 LBS

UNITS	P	HM	DESCRIPTION	WEIGHT IN LBS	RATE	CHARGES
			*CENF TARIFF 25			
6			PALLETS 3M INTERAM E-54A MAT 70	4350		
			8 ROLLS EACH			
1			PALLET STC 2 ROLLS E-54A MAT, 70	290		
			1 ROLL S/S WIRE, 66 ROLLS			
			FILAMENT TAPE, 100 EA WING			
			SEALS, 43 TUBES 3M FIREDAM 150			
			CONSIGNEE PHONE NUMBER:			
			(800)966-5253			
			DIFFERENCE IN BILLED AS WEIGHT	360		
			BILLED AS	5000		
			DISCOUNT CENF 25 0010500.0000			
			CENF 25 TEX 02206			

7-PALLET 5000 7713675

1. 2. 3. DRIVER UNITS DATE TIME

1-14-98 RECEIVED IN GOOD ORDER EXCEPT AS NOTED X Donald Lopez

RECEIVING CO. NAME

SURCHARGE CONTINUED

PRINT LAST NAME Donald Lopez

SEAL #

INTACT ON RECEIPT X

AMT. DUE

AMT. COLLECTED

BACK OF DELIVERY RECEIPT DATE 01/12/98

HTN 147 KMO C1SAY113

FREIGHT BILL # XXXXXXXXCFL#99002067-9

SHIPPER 3600 0 BT

PROMATEC

15926 CYPRESS N. HOUSTON

SUITE 150

CYPRESS TX 77429

Central Freight Lines, Inc.

CORPORATE HEADQUARTERS P.O. BOX 2638 WACO, TX 76702-2638 PHONE (254) 772-2120

SCAC=CENF

CUSTOMER COPY

ROUTING 0451658004 FB# 990020679 IL

CONSIGNEE 6600

PROMATIC TECHNOLOGIES INC

16015 SHADY FALLS RD

% OMEGA POINT LABRATORIES

ELMENDORF TX 78112

REF. #

BL CTP2009

PO# 2116

0000000000 LBS

UNITS	P	HM	DESCRIPTION	WEIGHT IN LBS	RATE	CHARGES
			@@@SYN			
7			*PREPAID CHARGES ON INVOICE COPY ONLY*	4640		

1. 2. 3. DRIVER UNITS DATE TIME

1-14-98 RECEIVED IN GOOD ORDER EXCEPT AS NOTED X Donald Lopez

RECEIVING CO. NAME

SURCHARGE

PRINT LAST NAME Donald Lopez

SEAL #

INTACT ON RECEIPT X

AMT. DUE

AMT. COLLECTED

3M

Cube	Pieces	Weight

Refer To This Number In Any Communication

Customer Order Nbr. (Charge To)	Order Date
2113	010798

010898

Mark Shipping Label (Cust. Ref.): REF:CTP-2009

Invoice Number: ZR17922

Page: 1

Shipped Date: 1-14-98

This is a Back Order of our Invoice Number

Requested Shipping Date

SHIP TO
OMEGA POINT LABORATORIES
INC
16915 SHADY FALLS
ELMENDORF TX 781129784

CHARGE TO
OMEGA POINT LABORATORIES
INC
16015 SHADY FALLS
ELMENDORF TX 781129784

Via BEST WAY

0641 TRANS DEPT LPI

Thank you for your order.
This Packing List is provided to help you check this shipment against your order.
An Invoice for the quantities shipped will be mailed to the **Charge To** address above, from our St. Paul office within a few days.
Any items ordered, but not shipped, will be shipped and billed on a separate invoice.

Seq. No.	You Ordered	We Shipped	We Backordered	Bill Unit	Trade Numbers(DC/UPC) or 3M ID	Description of Item Ordered	Pieces	FCC HMC	Weight
001	38	38	0	RLS CUST	98-0400-0172-3 LINE # 000001	INTERAM T-49 TAPE 4" X 180'	19 BOX	T88 5	167 AV OH
		TLN				CERAMIC FREIGHT CHARGE			
					1-9036	QUESTION? CALL YOUR 3M CUSTOMER SERVICE PROVIDER:			
		7110-1-4			Tracy Mur	,KIMBERLY WRIGHT			
				X		3M CERAMIC MATLS FPF 207-1S-0			
						ST PAUL		1	
						MN 55144-1000			
						PHONE (800) 828-3910			
					T88 000	FAX (800) 523-4379		19	
							177		
							30		
							167		
T885A		19	167	S/U	* 19	* 167 CUBE *	15		TLN

390

PACKING LIST

OMEGA POINT LABORATORIES

Client Name: Promatec

Page: 1 of 1 391

Client #: 8610 Project #: 102570

Date: 1-14-98

Description: 3M ESAA Mat and 3M Fire Dam 150 Caulk.

Name: Patton

R.R.# 1732

3M ESAA Mat		3M Fire Dam 150 Caulk	
✓5470617656 0073223012	~~IIII~~ ~~IIII~~ II	7661J7	– 24 tubes
✓5470617652 0073223012	~~IIII~~ ~~IIII~~ II	7657J7	– 7 tubes
		7761J7	– 12 tubes
✓5470417520 0072513011	~~IIII~~ III		43 tubes
✓5470417534 0071713011	~~IIII~~ I		
✓5470417417 0071713011	II		
✓5470617657 0073223012	~~IIII~~ II		
✓5470617659 0073222012	III		
Total	50 boxes		

Appendix F

PHOTOGRAPHS

OMEGA POINT LABORATORIES

#1: Slab reinforcement

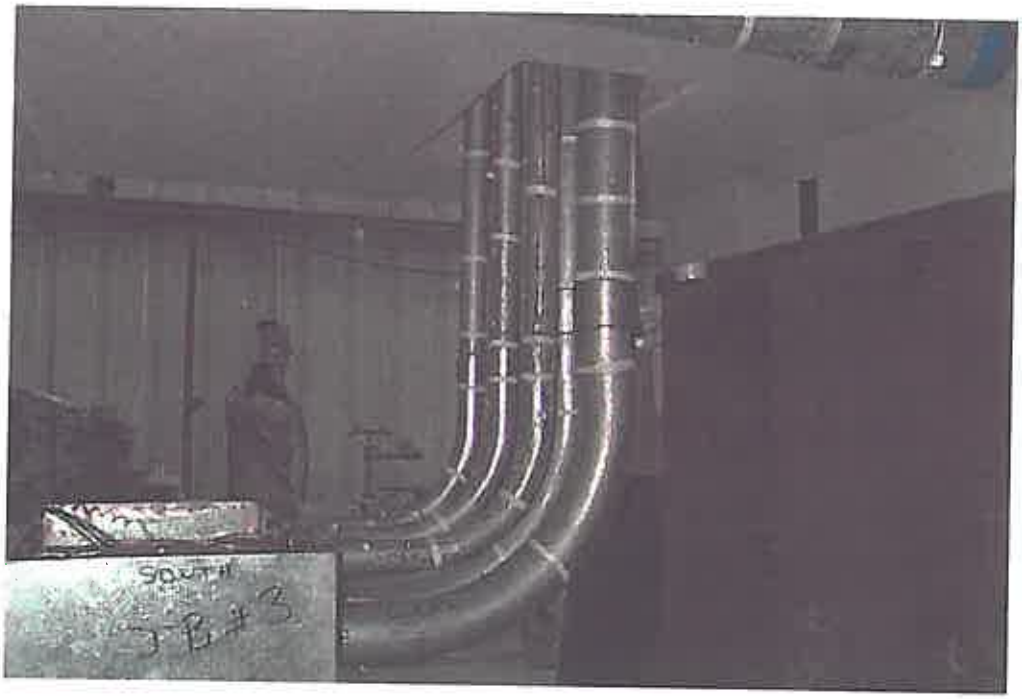
#2: Pouring concrete.

#3: Freshly poured slab.

#4: Junction Box #1 installed on slab.

#5: Junction Box #2 installed and instrumented.

#6: Junction Box #3 installed and instrumented.



#7: Conduits 1 - 6 viewed from south side.

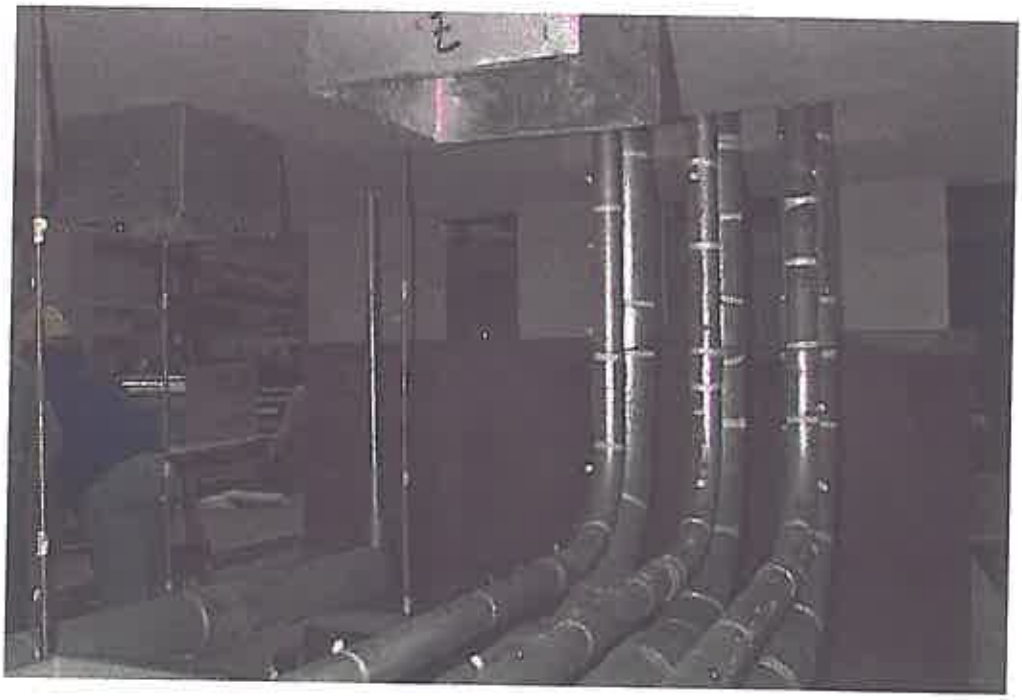
#8: Conduits 1-6 & JB#3 viewed from the East side.

#9: Conduit #9 installed and instrumented.

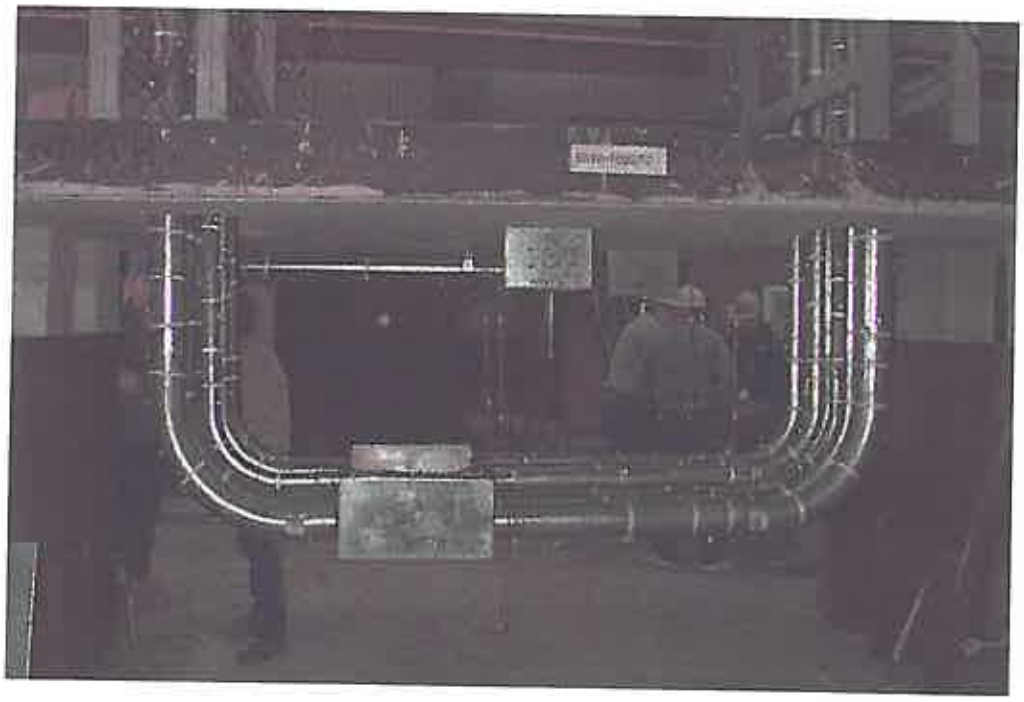
#10: JB#1 with 2nd layer of Interam installed.

#11: Concrete seal on Conduits 1 - 6 penetrating the slab (East end).

#12: Concrete seal on Conduits 1 - 6 penetrating the slab (West end).

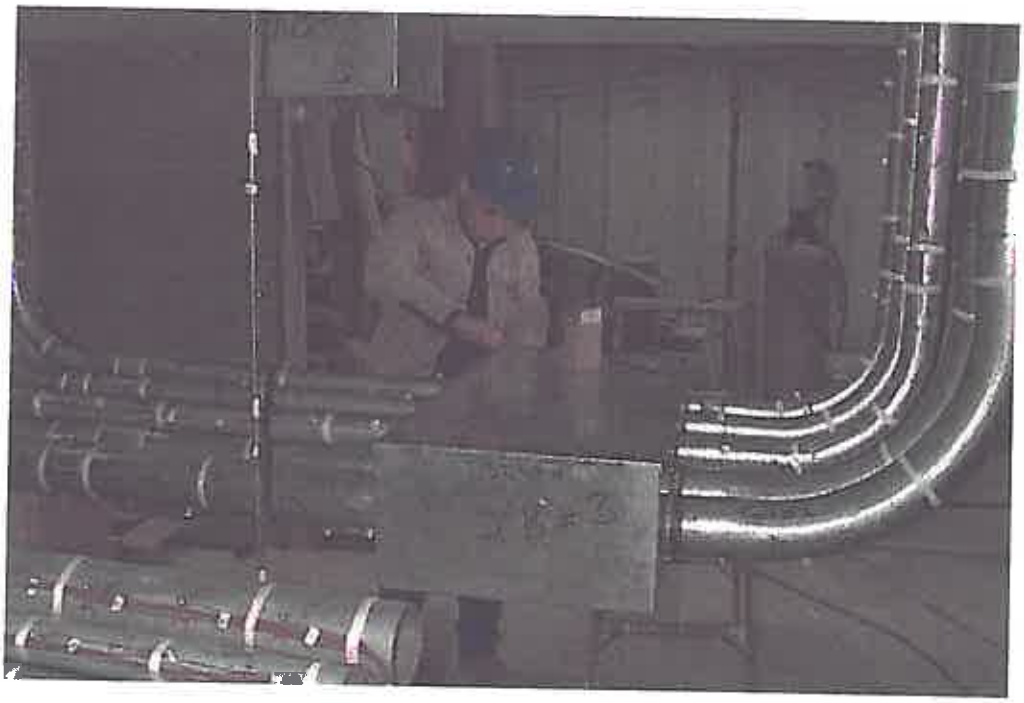


#13: Conduits 1 - 6 viewed from East end.

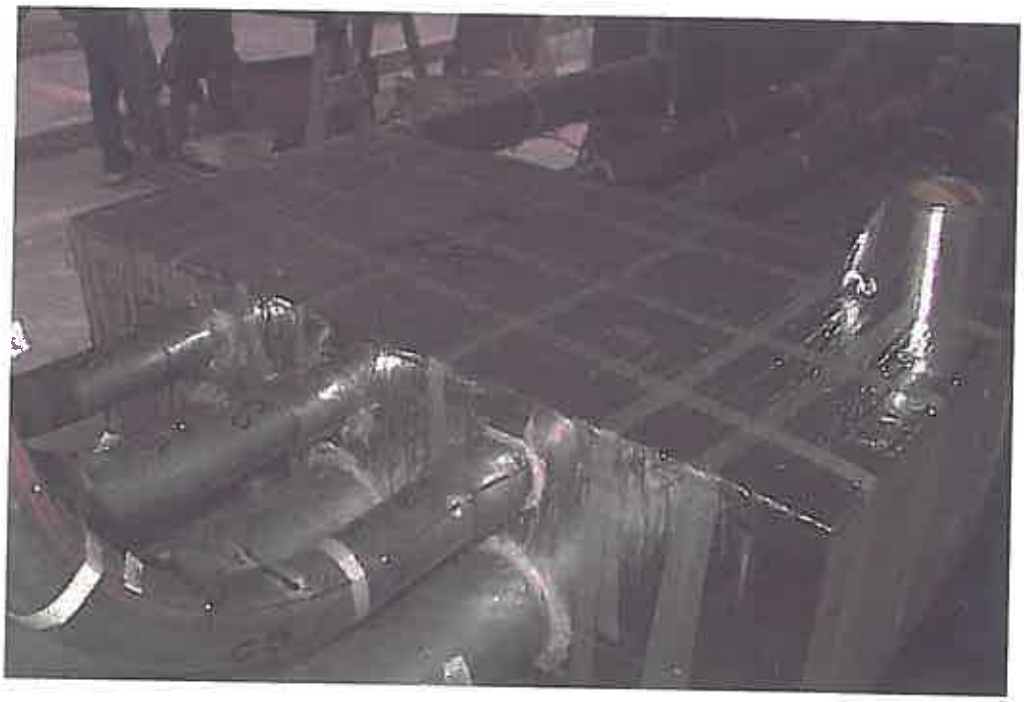


#14: Conduits 1 - 6 and JB #3 viewed from North side.

#15: JB #3 instrumented and ready to clad.



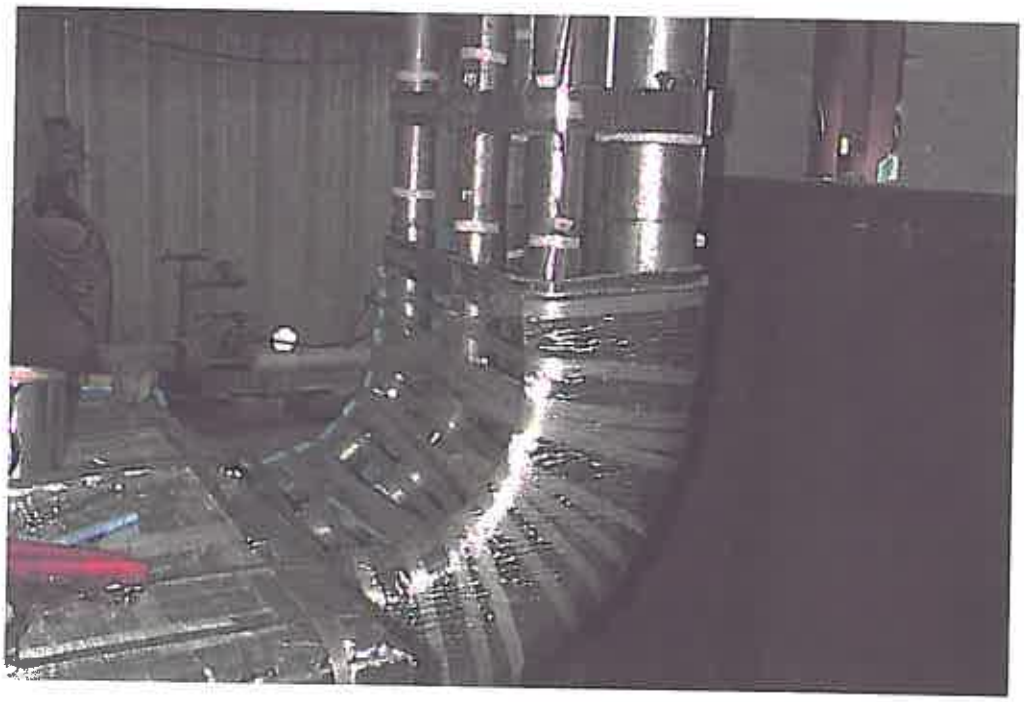
#16: Closing JB #3 prior to cladding.



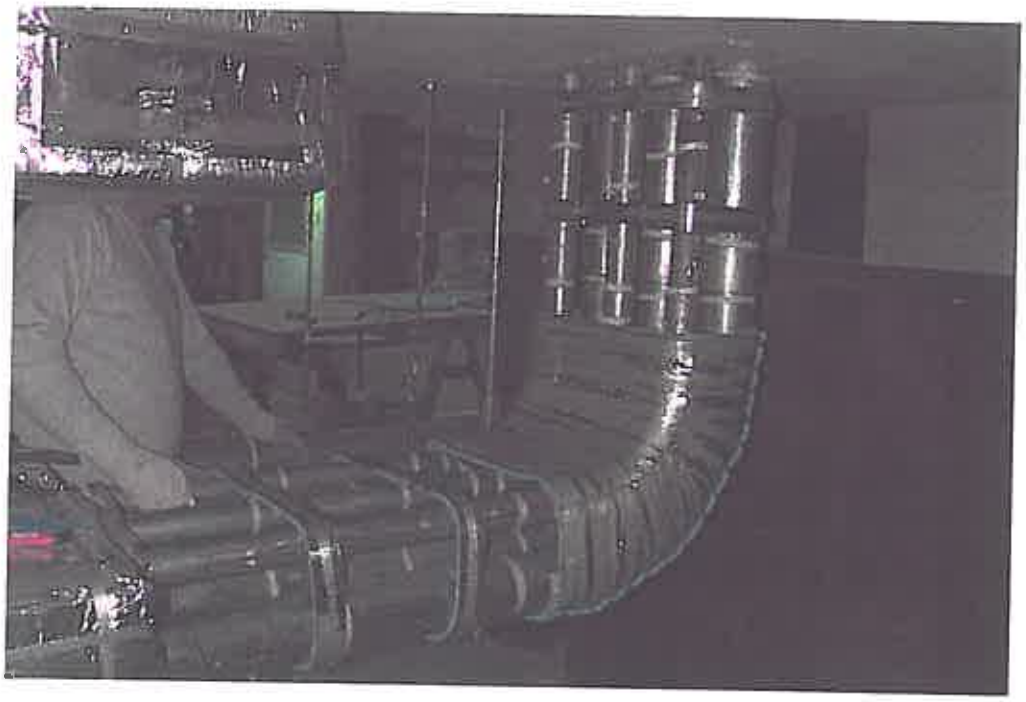
#17: Cladding JB #3.

#18: Cladding JB #3.

#19: Cladding JB #3.

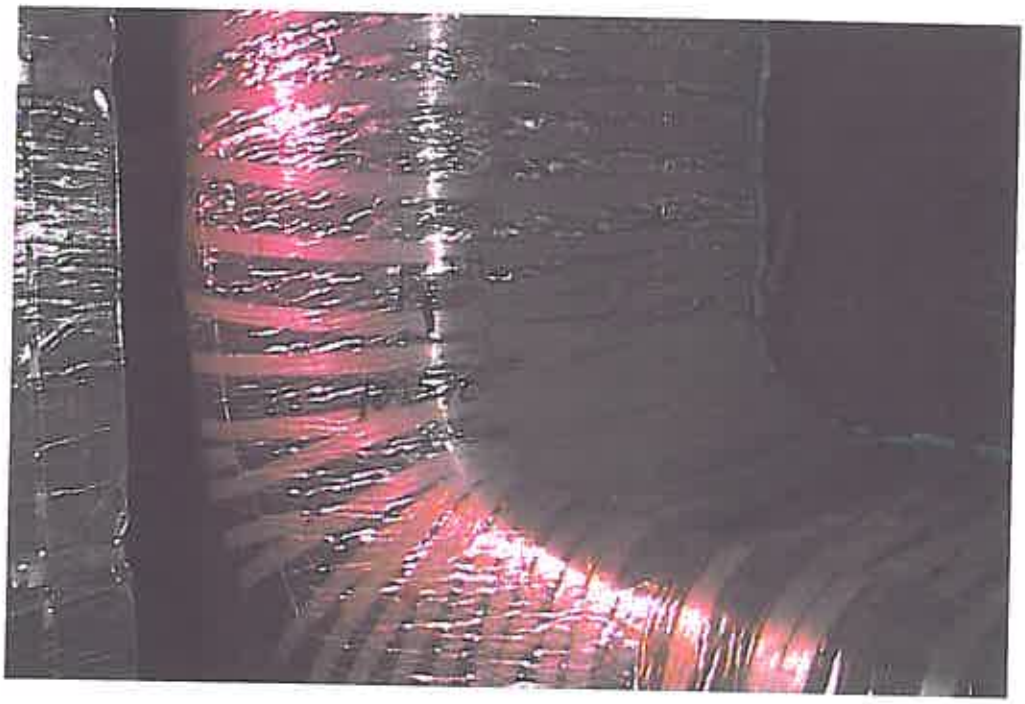


#20: Beginning to clad Conduits 1 - 6.



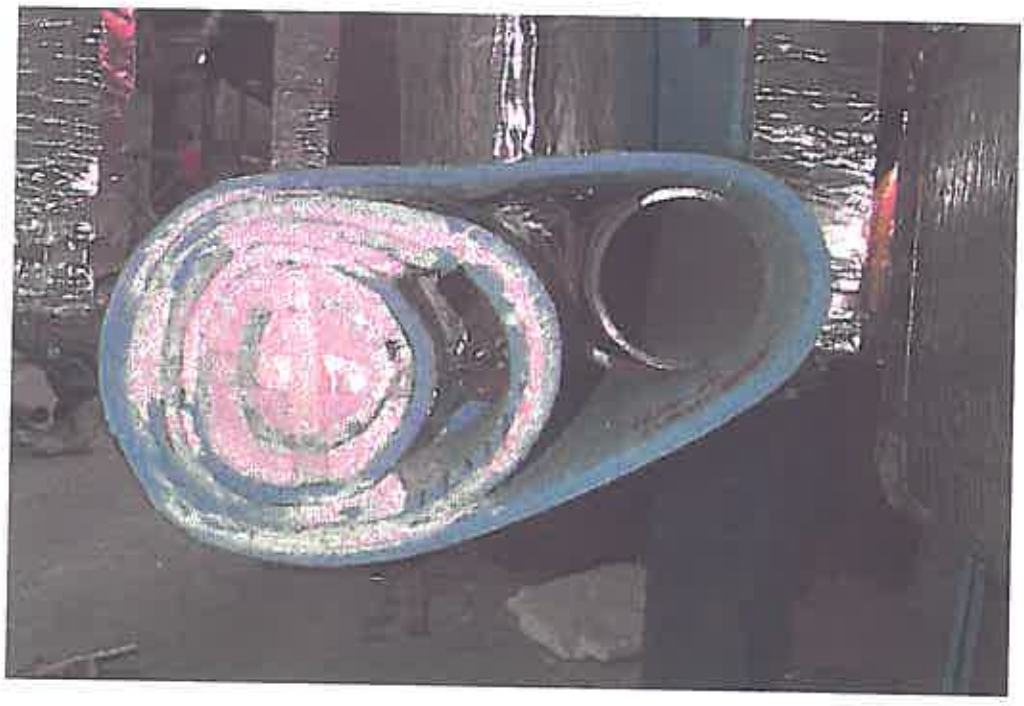
#21: Cladding the other end of Conduits 1 - 6.

#22: Cladding Conduits 1 - 6.



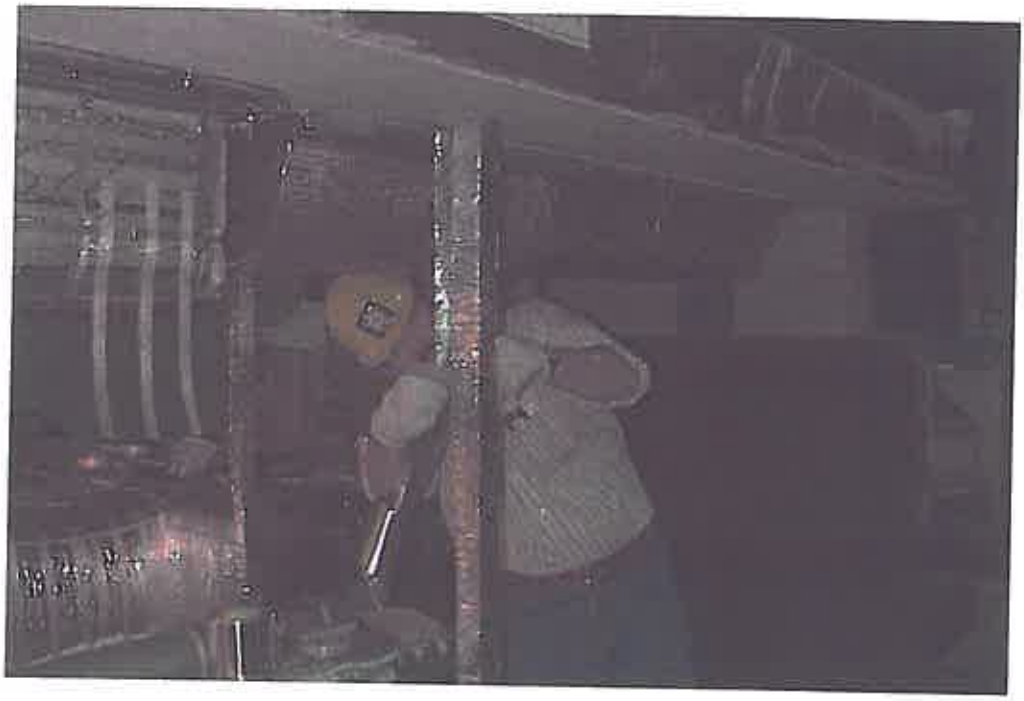
#23: Cladding Conduits 1 - 6 (fifth layer.

#24: Conduit #10 being clad.

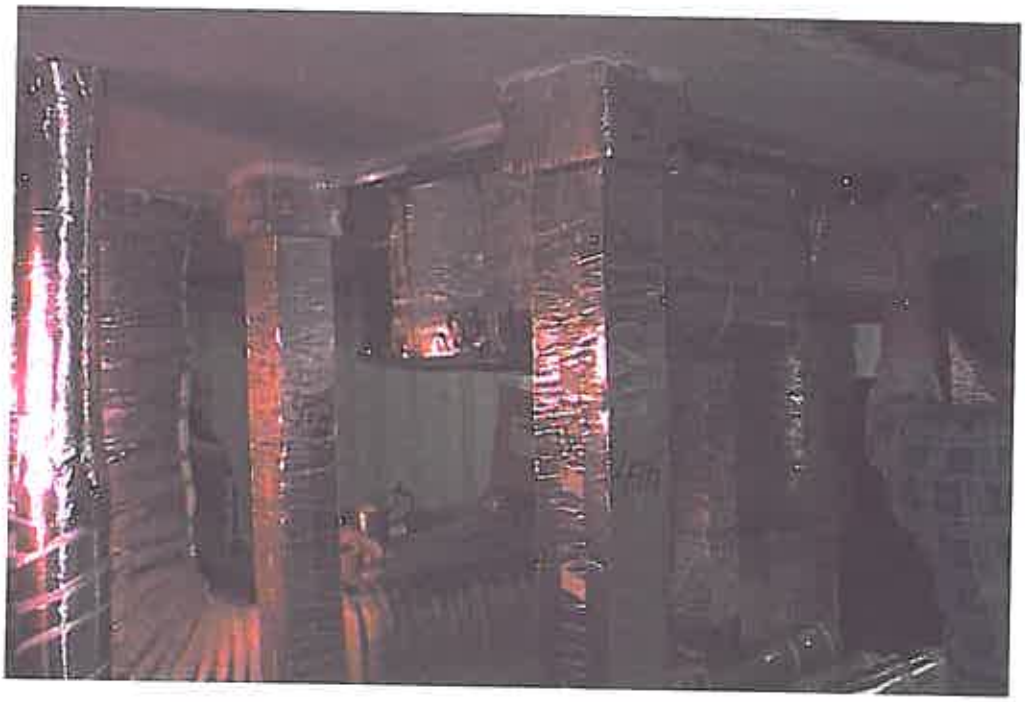


#25: End view of Conduit #10 being wrapped.

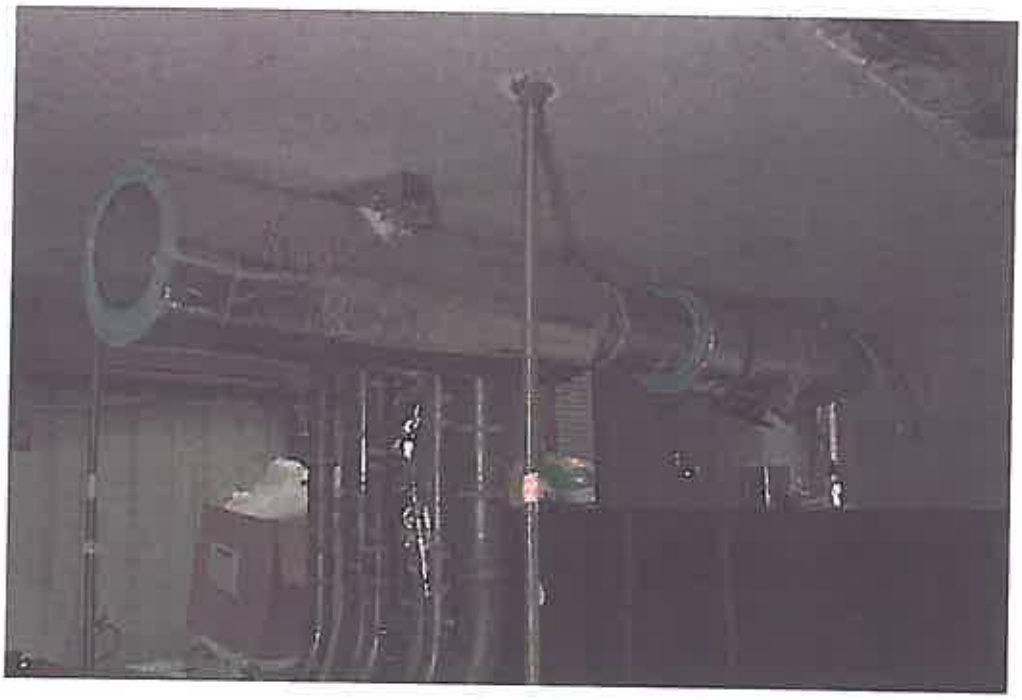
#26: Wrapping Conduit #10 at the support.



#27: Protecting the trapeze support.



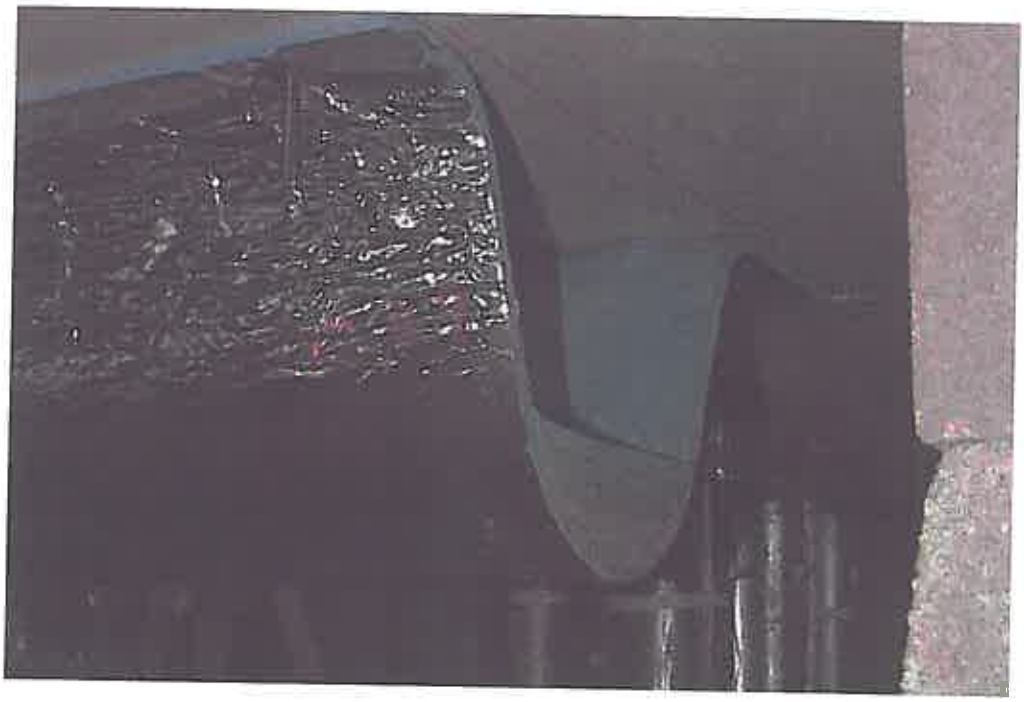
#28: Conduit #10 trapeze wrapping.



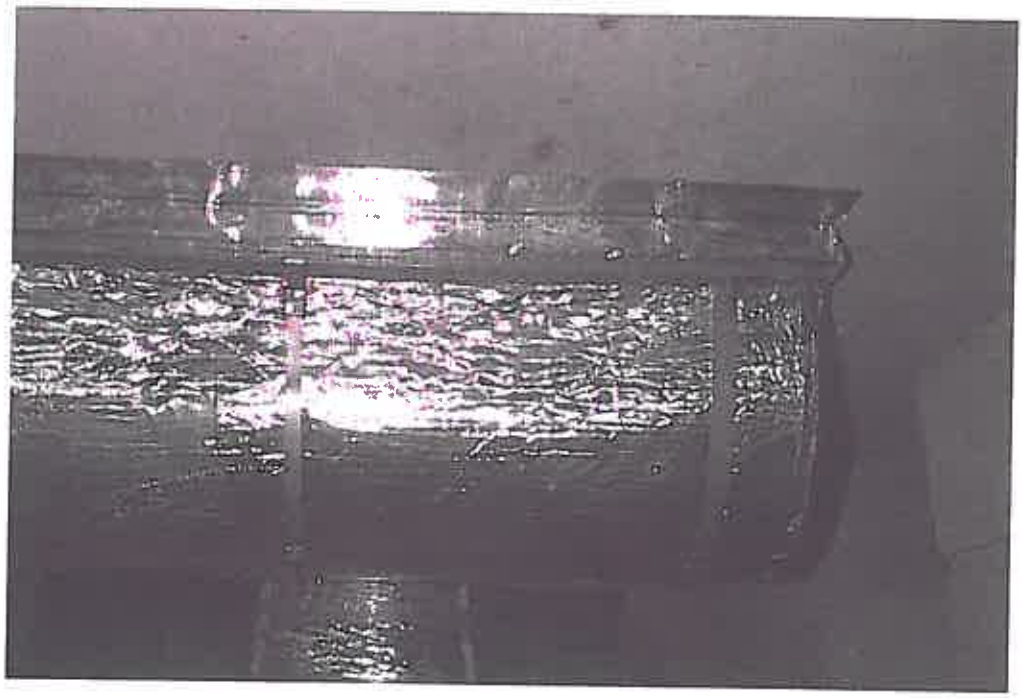
#29: Conduit #9 with several layers of Interam.

#30: 2nd layer of Interam on Conduit #9.

#31: Applying FireDam Caulk to Conduit #9 wrap system.

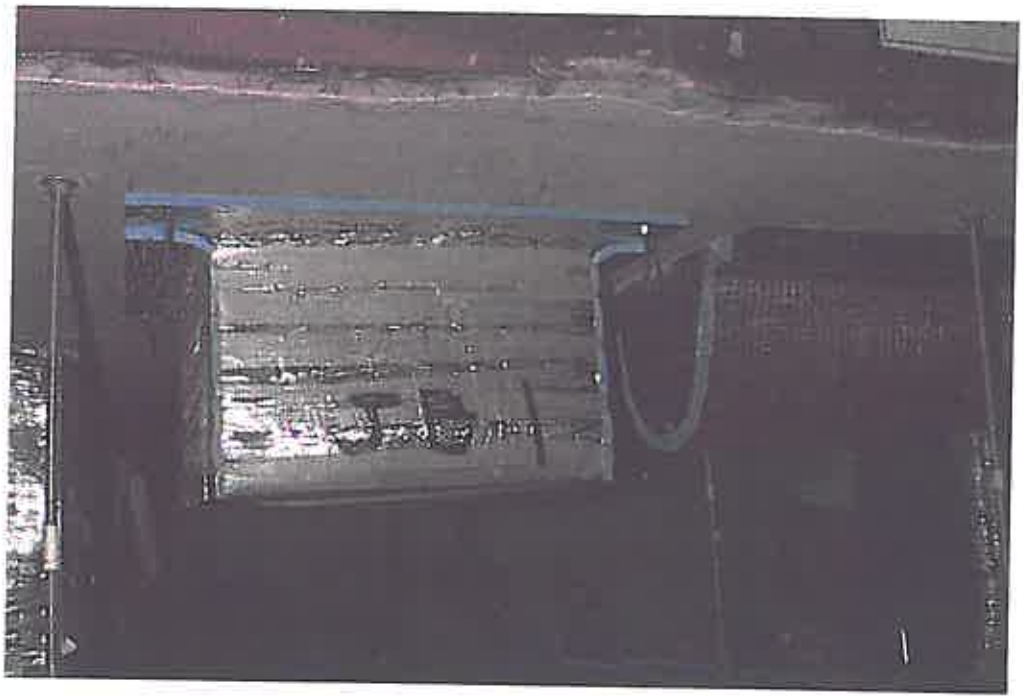


#32: Completing the wrap system on Conduit #9.



#33: Conduit #9 side with no wire.

#34: Preparing the wrap for JB #2.



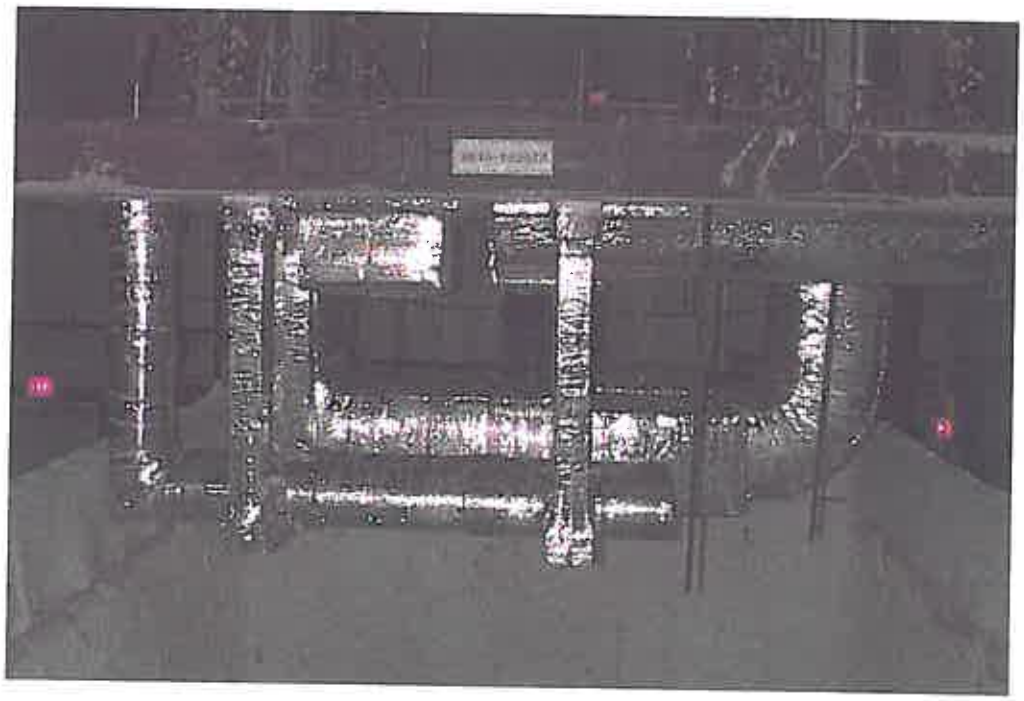
#35: First few layers on JB #1.

#36: JB #1 nearing completion.

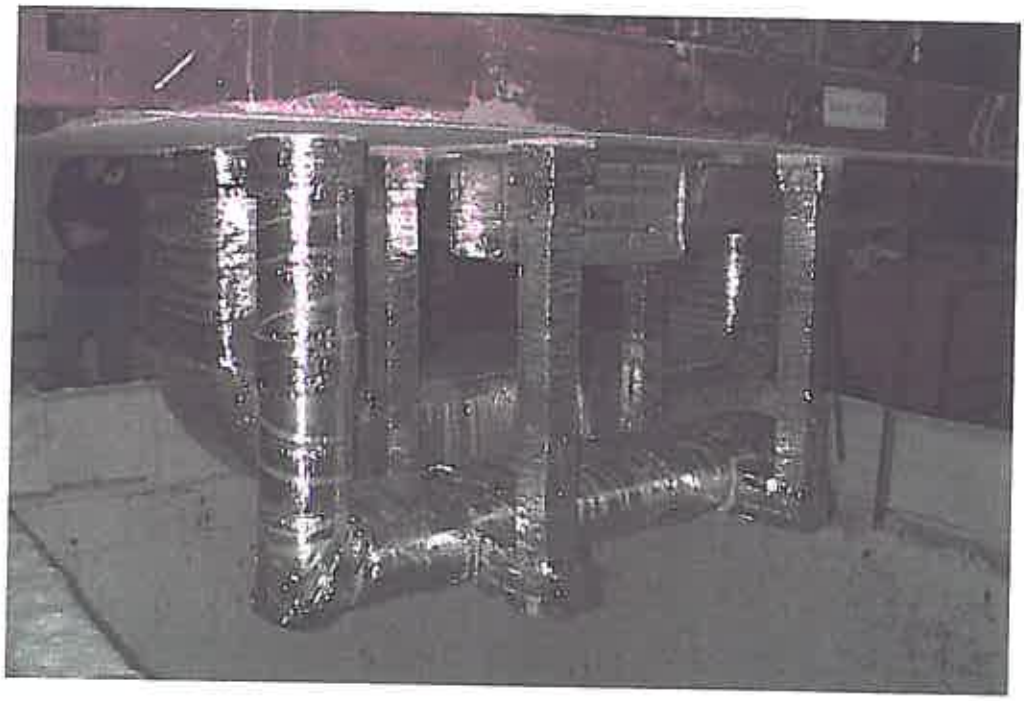
#37: Installing Interam on JBs #1 and #3.

#38: JB #2 being wrapped.

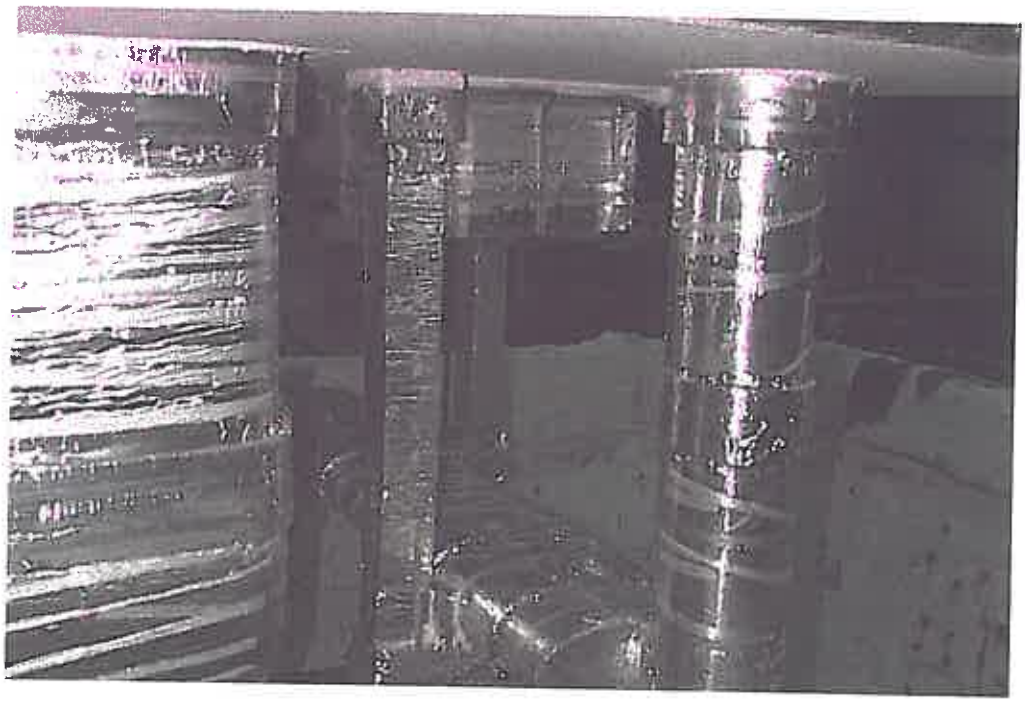
#39: View of Conduit #9 completed.



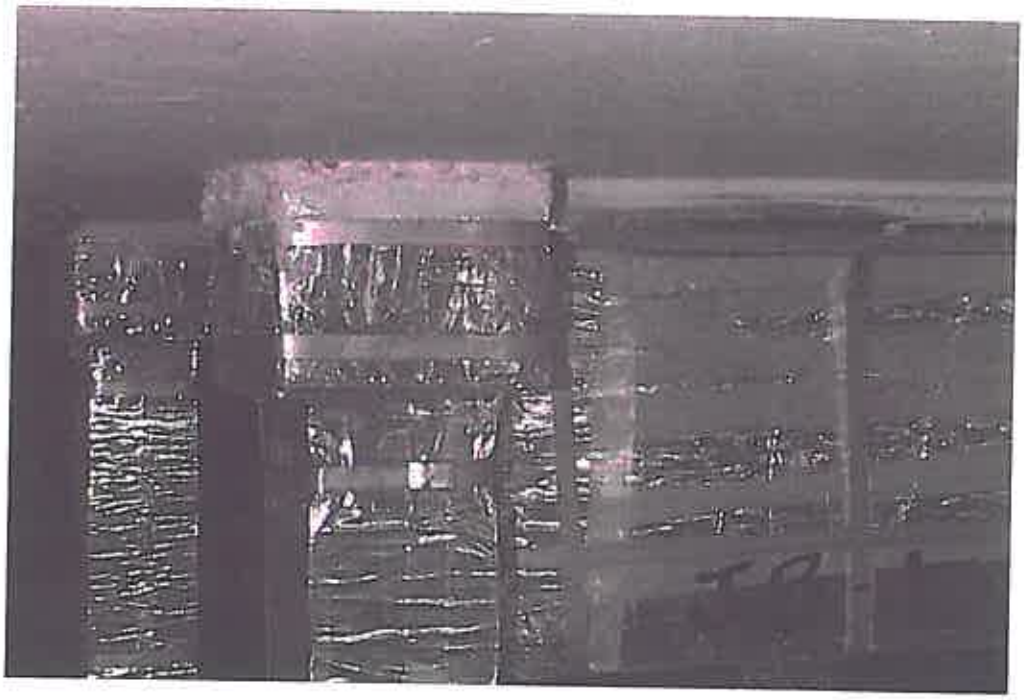
#40: Side view from the South of completed test article.



#41: View of completed article.

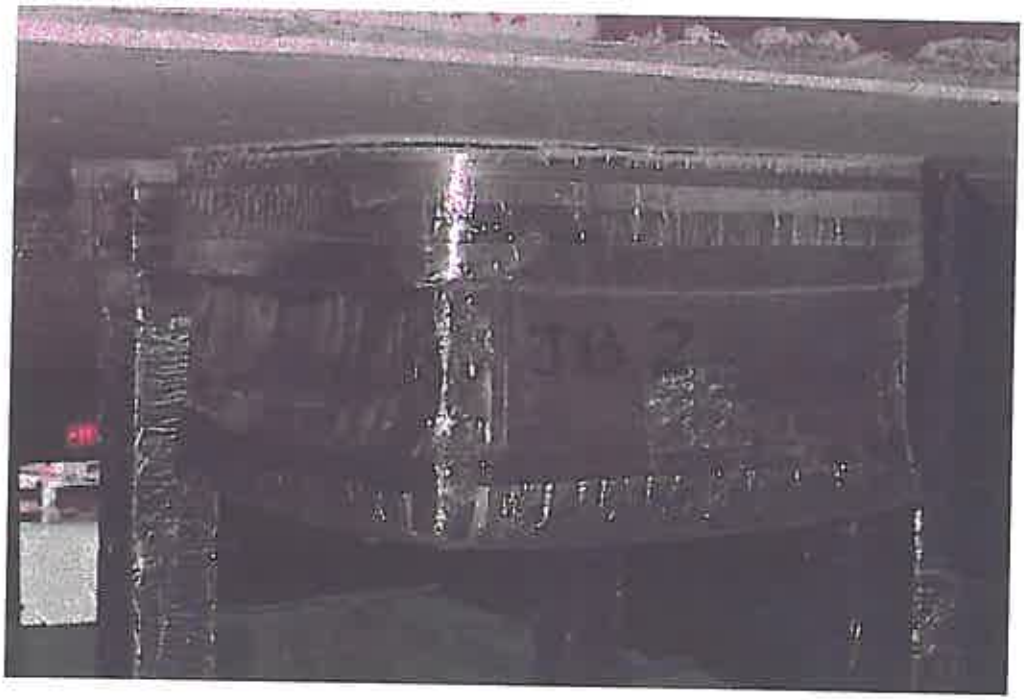


#42: View of completed test article.



#43: Hanger supports on Conduit #10.

#44: Junction Box #1.

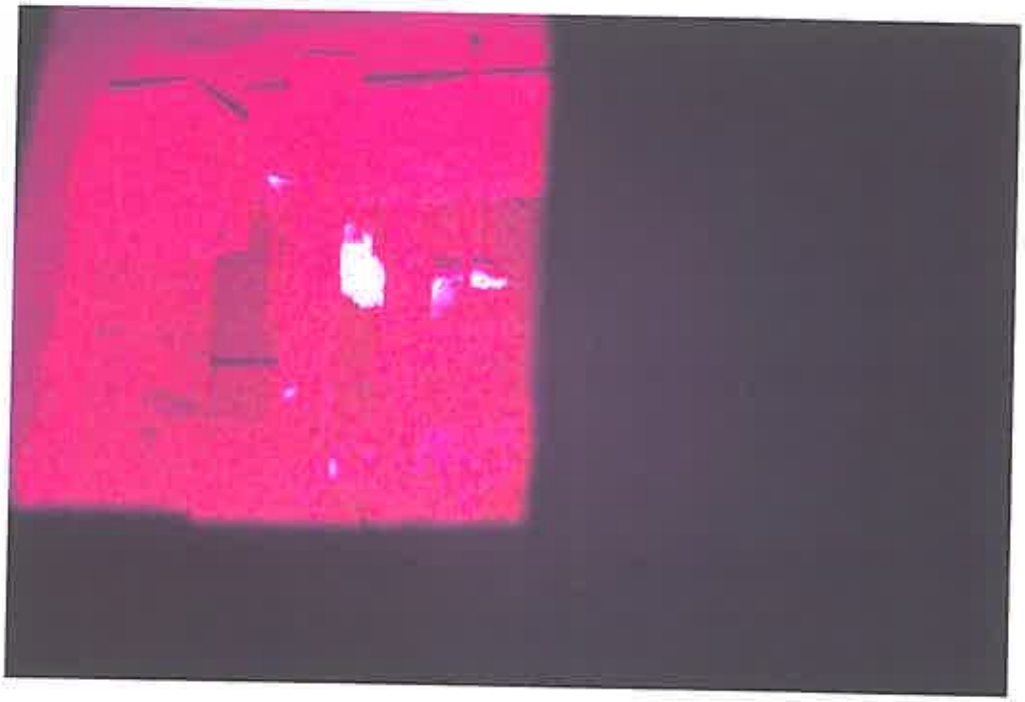


#45: Junction Box #2.

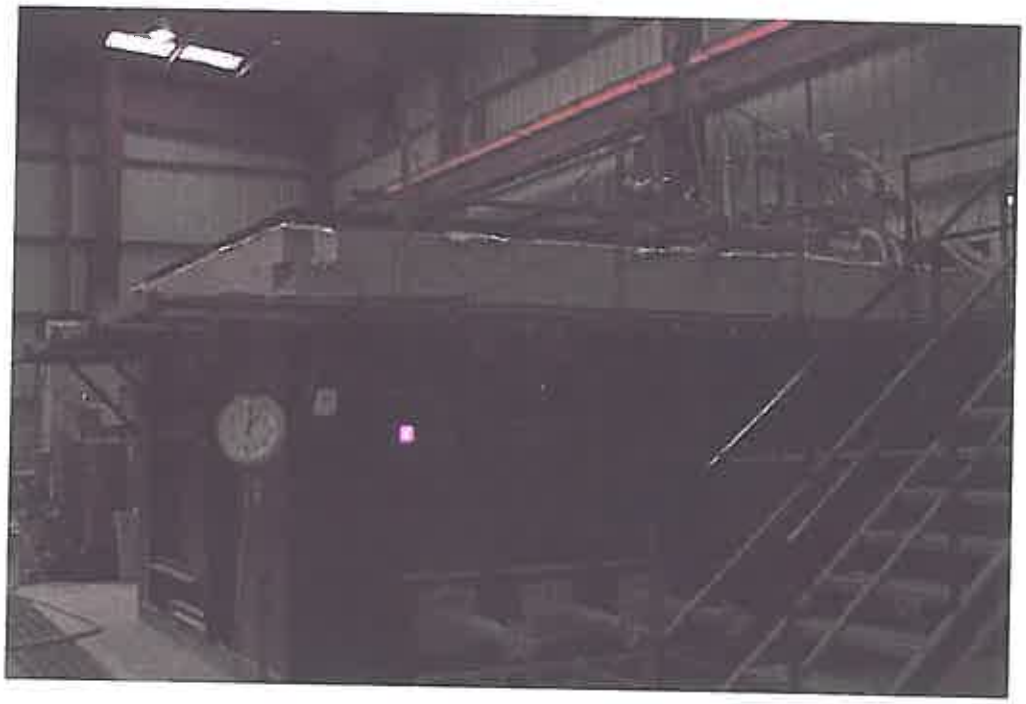
#46: Test article installed on top of the test furnace.

#47: Speciment mounted on furnace and TCs connected.

#48: Side view of furnace with specimen mounted on it.

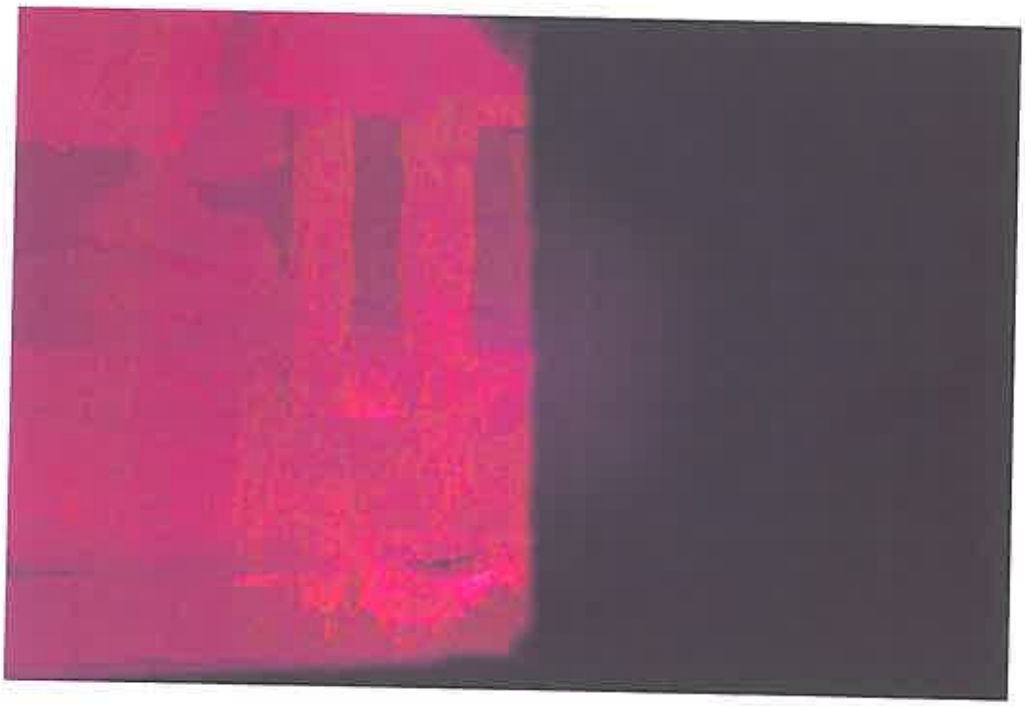


#49: Ignition of the tape around the wrap system.



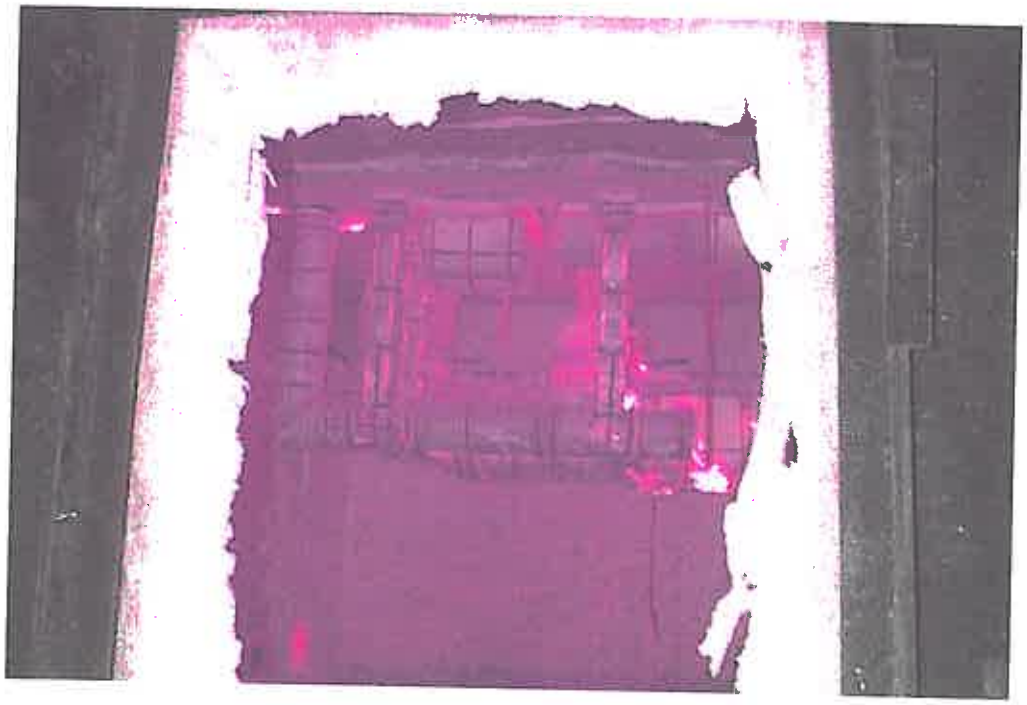
#50: Furnace at 60 minutes of fire exposure.

#51: Furnace at 120 minutes of fire exposure.

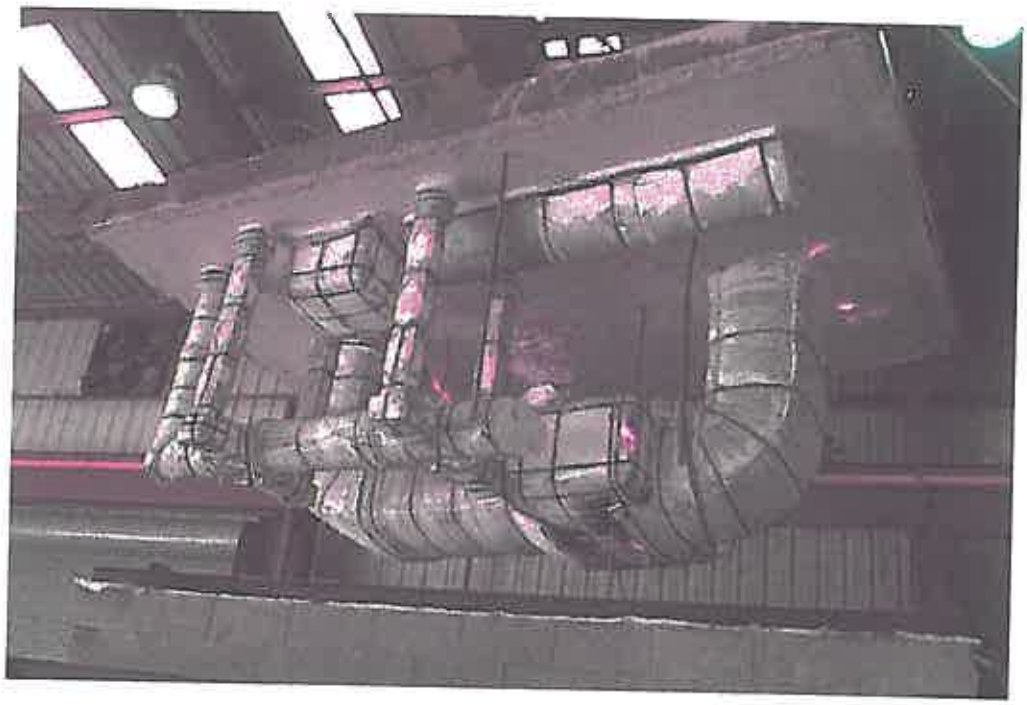


#52: Test article inside furnace at 120 minutes.

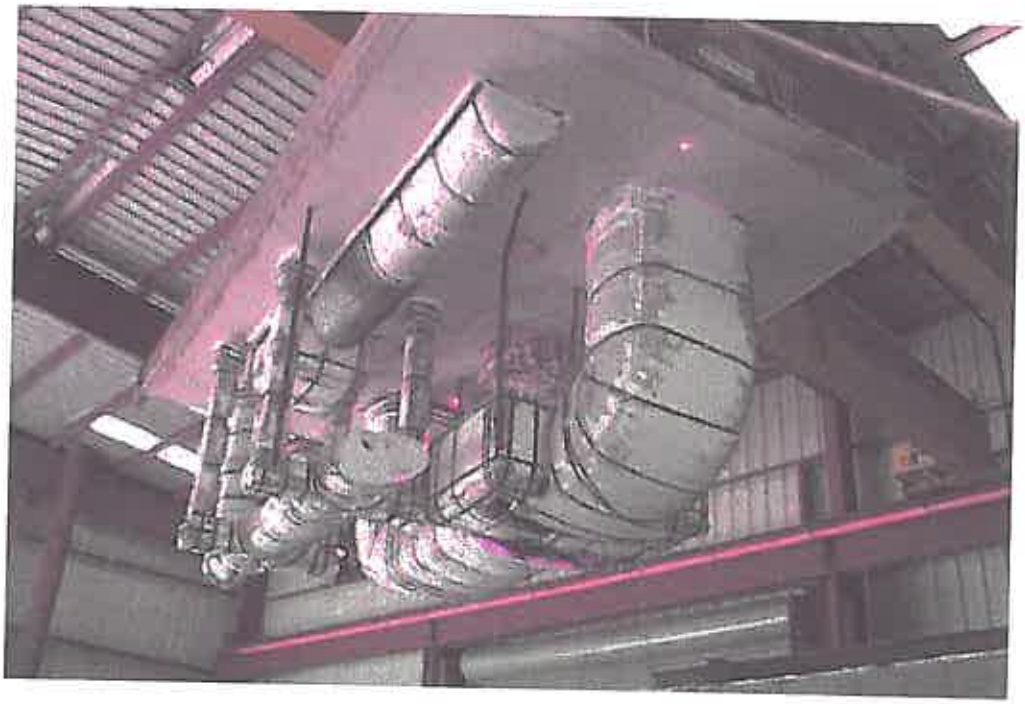
#53: Test ended at 180 minutes.



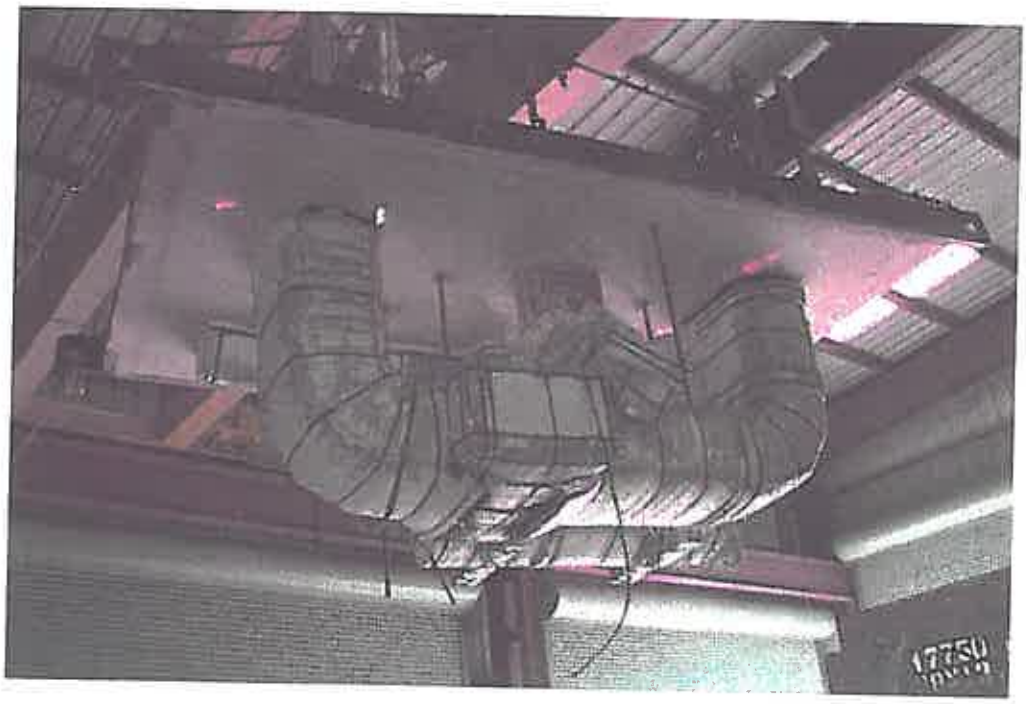
#54: View inside furnace at end of test.



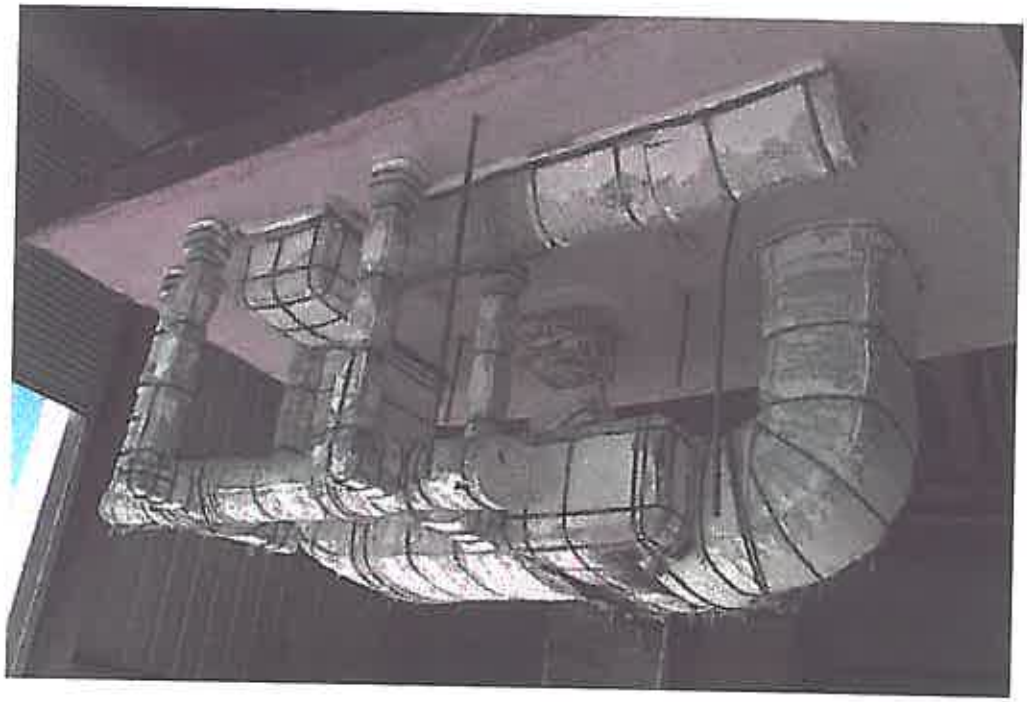
#55: Lifting the specimen from the furnace at end of test.



#56: Moving the specimen to the hose stream area.

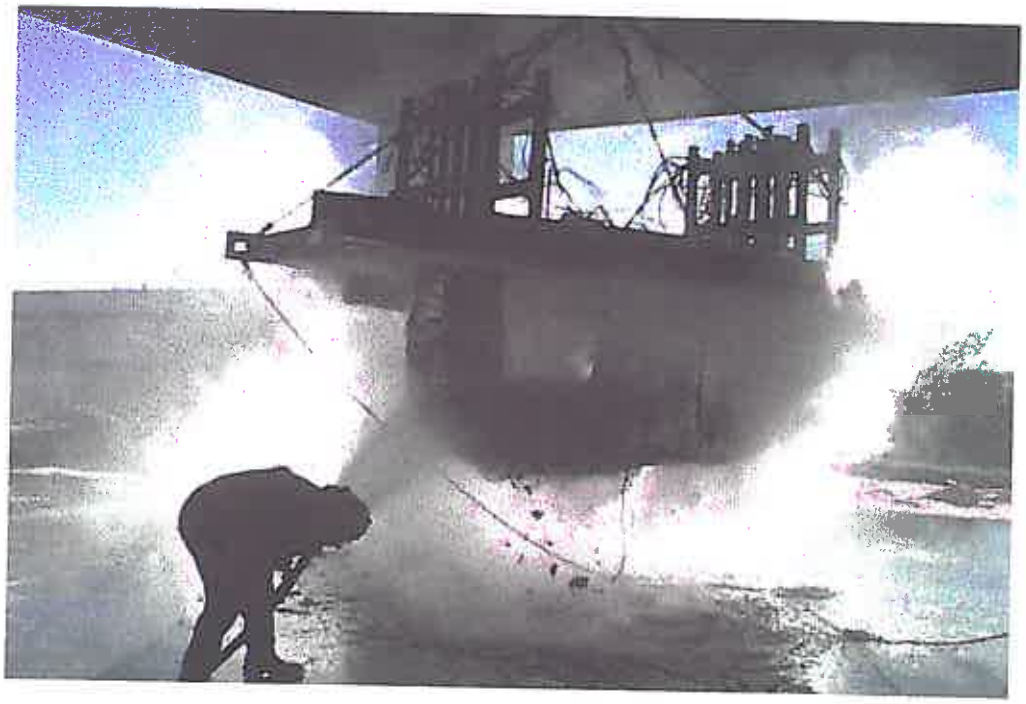


#57: Moving the specimen to the hose stream area.



#58: Moving the specimen to the hose stream area.

#59: 30° hose stream test.



#60: Hose stream test.

#61: Hose stream test.

#62: Hose stream test.

#63: Conduit #10 after hose stream test.

#64: Conduit #10 and JB #1 after hose stream test.

#65: Junction Box #2.

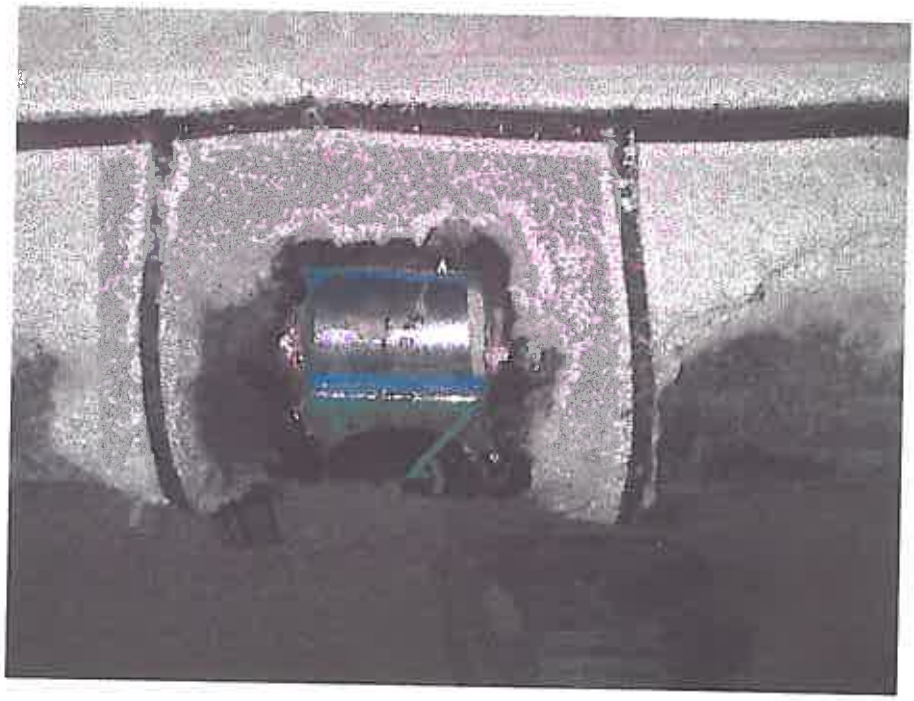
#66: End of Conduit #10 and side of JB #3.

#67: West side of Conduits 1-6.

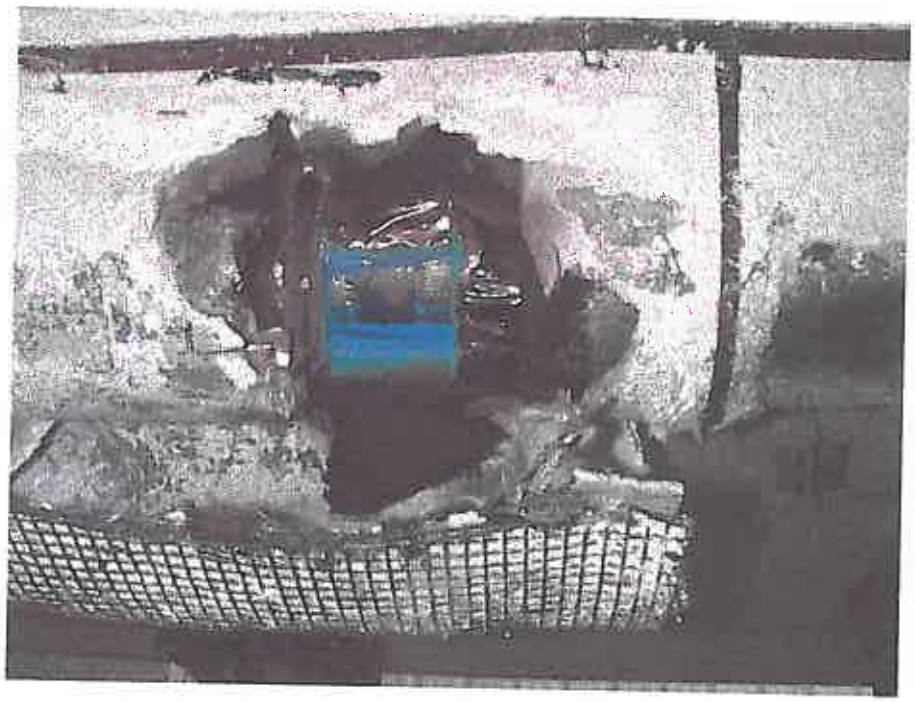
#68: Conduit #9.

#69: South side of Conduit #1-6.

#70: JB #1.



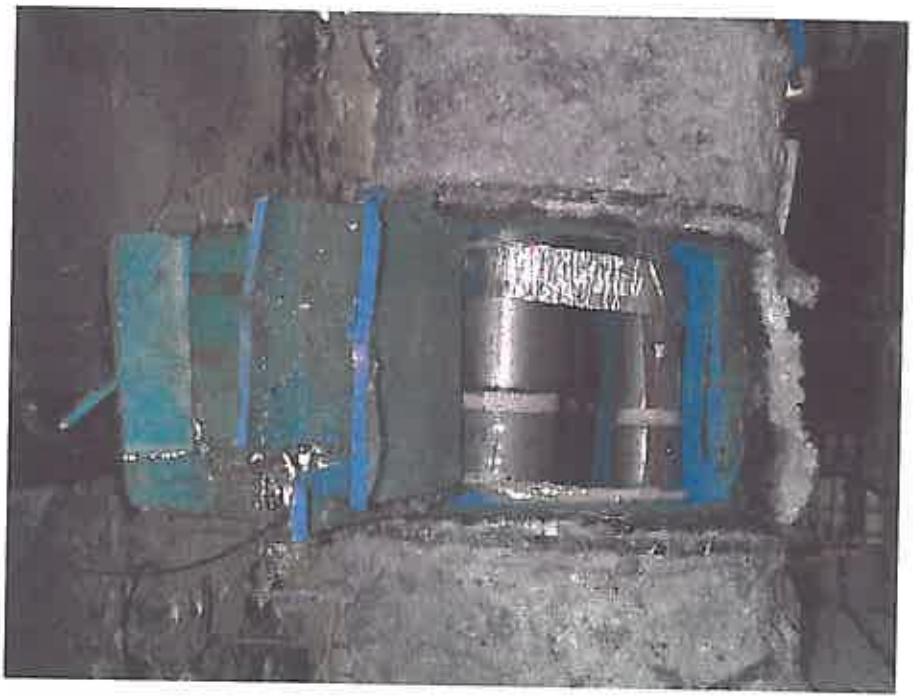
#71: Section of Conduit #9 with no wire overlap opened to reveal conduit.



#72: Section of Conduit #9 with wire overlap opened to reveal conduit.

#73: Section of Conduit #10 cut away to reveal undamaged pipe.

#74: Section of riser pipe on Conduit #10 cut away.



#75: Section of Conduits 1-6 cut away.

#76: Section of 90° radius on Conduits 1 - 6.

#77: Section of Conduits 1 - 6 cut away against the slab.

#78: Section cut away from JB #1.

#79: Section cut away from the side of JB #3.

Appendix G
Analysis of Thermocouple Data

OMEGA POINT LABORATORIES

Time (min)	E119 Std (°F)	Furnace Avg (°F)	Conduit #1 Bare #8 Maximum Temp (°F)	Conduit #1 Bare #8 Average Temp (°F)	Conduit #1 Bare #8 Minimum Temp (°F)	Conduit #1 Surface Maximum Temp (°F)	Conduit #1 Surface Average Temp (°F)
0	68	70	69	67	66	64	61
1	254	129	69	67	66	65	61
2	441	395	69	67	66	65	62
3	627	769	69	67	66	66	62
4	814	995	69	67	66	66	62
5	1000	1057	69	67	66	65	62
6	1060	1071	69	67	66	65	61
7	1120	1075	69	67	66	65	61
8	1180	1090	70	67	66	65	62
9	1240	1162	70	67	66	65	62
10	1300	1262	70	67	66	66	62
11	1320	1330	70	67	66	66	62
12	1340	1359	70	67	66	66	61
13	1359	1374	70	67	66	65	57
14	1379	1386	70	67	66	67	57
15	1399	1395	70	67	66	74	63
16	1412	1405	70	67	66	75	63
17	1424	1414	71	68	66	76	63
18	1437	1427	72	68	66	78	63
19	1449	1438	73	68	66	80	64
20	1462	1453	74	68	66	81	64
21	1472	1462	74	68	66	83	64
22	1481	1471	75	68	66	85	65
23	1491	1480	76	69	66	87	65
24	1500	1489	77	69	66	89	65
25	1510	1502	78	69	66	91	66
26	1518	1514	79	69	66	92	66
27	1526	1525	80	69	66	93	66
28	1534	1532	81	70	66	95	66
29	1542	1538	82	70	66	96	67
30	1550	1548	83	70	66	97	67
31	1557	1560	84	70	66	98	68
32	1564	1570	85	71	67	100	68
33	1570	1578	86	71	67	101	68
34	1577	1586	87	71	67	102	69
35	1584	1595	88	72	67	103	69
36	1590	1605	89	72	67	105	70
37	1596	1620	90	73	67	107	71
38	1601	1632	91	73	67	108	72
39	1607	1632	92	74	67	110	72
40	1613	1632	93	75	67	112	73
41	1618	1635	94	75	67	114	74
42	1623	1641	96	76	67	117	75

Time (min)	E119 Std (°F)	Furnace Avg (°F)	Conduit #1 Bare #8 Maximum Temp (°F)	Conduit #1 Bare #8 Average Temp (°F)	Conduit #1 Bare #8 Minimum Temp (°F)	Conduit #1 Surface Maximum Temp (°F)	Conduit #1 Surface Average Temp (°F)
43	1628	1633	97	77	67	119	76
44	1633	1629	98	77	67	122	77
45	1638	1630	99	78	67	125	78
46	1643	1631	101	79	68	127	79
47	1647	1634	102	80	68	130	80
48	1652	1643	103	81	68	132	81
49	1656	1651	105	82	68	134	82
50	1661	1654	106	83	68	136	83
51	1665	1658	107	83	68	138	84
52	1669	1660	108	84	69	139	85
53	1673	1663	110	85	69	141	86
54	1677	1668	111	86	69	143	87
55	1681	1674	113	87	69	144	88
56	1685	1679	114	88	70	146	89
57	1689	1685	116	89	70	148	90
58	1692	1688	117	90	70	150	91
59	1696	1690	119	91	71	152	92
60	1700	1691	120	92	71	153	93
61	1704	1692	121	93	72	155	94
62	1707	1694	123	94	72	156	95
63	1711	1699	124	95	73	157	96
64	1714	1702	125	96	73	159	97
65	1718	1707	127	97	74	160	98
66	1721	1708	128	98	74	161	99
67	1725	1710	129	99	75	162	100
68	1728	1715	130	100	76	162	101
69	1732	1717	131	101	76	164	103
70	1735	1721	133	102	77	164	104
71	1738	1727	134	103	78	165	105
72	1741	1731	135	104	78	166	106
73	1744	1731	136	105	79	167	107
74	1747	1736	137	106	80	168	108
75	1750	1738	138	107	81	169	110
76	1753	1739	139	108	81	170	111
77	1756	1740	140	109	82	171	112
78	1759	1744	141	111	83	172	113
79	1762	1749	143	112	84	173	114
80	1765	1754	144	113	85	174	116
81	1768	1757	145	114	86	175	117
82	1771	1762	146	115	87	176	118
83	1773	1765	147	117	88	177	119
84	1776	1765	148	118	89	178	120
85	1779	1765	149	119	89	179	122

Time (min)	E119 Std (°F)	Furnace Avg (°F)	Conduit #1 Bare #8 Maximum Temp (°F)	Conduit #1 Bare #8 Average Temp (°F)	Conduit #1 Bare #8 Minimum Temp (°F)	Conduit #1 Surface Maximum Temp (°F)	Conduit #1 Surface Average Temp (°F)
86	1782	1764	150	120	90	180	123
87	1784	1766	151	121	91	181	124
88	1787	1769	152	122	92	182	125
89	1789	1774	153	124	93	183	126
90	1792	1777	155	125	94	184	128
91	1794	1779	156	126	95	185	129
92	1797	1783	157	127	96	186	130
93	1799	1785	159	129	97	187	131
94	1802	1788	160	130	98	188	132
95	1804	1790	161	131	99	189	134
96	1806	1793	163	132	100	190	135
97	1808	1796	164	133	101	191	136
98	1811	1797	165	135	102	191	137
99	1813	1799	166	136	102	192	138
100	1815	1800	167	137	103	193	139
101	1817	1803	168	138	104	193	141
102	1819	1804	169	139	105	194	142
103	1822	1807	170	140	106	195	143
104	1824	1812	170	142	107	195	144
105	1826	1812	171	143	108	196	145
106	1828	1814	172	144	110	197	147
107	1830	1818	173	145	111	199	148
108	1831	1820	174	146	112	200	149
109	1833	1825	175	148	113	202	151
110	1835	1827	176	149	114	204	152
111	1837	1830	177	150	115	205	153
112	1838	1834	178	151	116	206	154
113	1840	1837	179	152	117	208	155
114	1841	1840	180	153	118	209	156
115	1843	1843	182	154	119	210	157
116	1844	1844	183	156	120	212	158
117	1846	1846	185	157	121	213	159
118	1847	1849	186	158	122	215	161
119	1849	1851	188	159	123	215	161
120	1850	1853	189	160	124	217	163
121	1851	1856	190	161	126	218	164
122	1853	1857	192	162	127	219	165
123	1854	1859	193	163	128	220	166
124	1855	1861	194	164	129	221	168
125	1856	1865	195	165	130	223	169
126	1858	1868	196	166	131	224	170
127	1859	1868	197	167	132	225	171
128	1860	1868	199	169	134	226	172

Time (min)	E119 Std (°F)	Furnace Avg (°F)	Conduit #1 Bare #8 Maximum Temp (°F)	Conduit #1 Bare #8 Average Temp (°F)	Conduit #1 Bare #8 Minimum Temp (°F)	Conduit #1 Surface Maximum Temp (°F)	Conduit #1 Surface Average Temp (°F)
129	1861	1873	200	170	135	228	174
130	1863	1877	201	171	136	229	175
131	1864	1879	202	172	138	230	176
132	1865	1880	203	173	139	231	177
133	1866	1881	205	174	141	232	179
134	1868	1884	206	176	142	234	180
135	1869	1887	207	177	144	235	181
136	1870	1887	208	178	146	236	182
137	1871	1888	210	179	147	235	182
138	1873	1891	211	180	149	237	183
139	1874	1893	212	182	151	238	184
140	1875	1895	213	183	152	239	186
141	1876	1896	215	184	154	240	187
142	1878	1899	216	185	155	242	188
143	1879	1899	217	186	156	243	189
144	1880	1898	219	188	158	244	191
145	1881	1897	220	189	159	245	192
146	1883	1892	221	190	160	247	193
147	1884	1891	222	191	161	248	194
148	1885	1888	223	192	163	249	195
149	1886	1886	225	193	164	251	196
150	1888	1887	226	194	165	252	198
151	1889	1888	227	195	166	253	199
152	1890	1884	228	196	167	255	200
153	1891	1884	230	197	168	256	201
154	1893	1887	231	198	169	257	202
155	1894	1884	232	199	170	259	203
156	1895	1887	233	201	171	260	204
157	1896	1891	234	202	172	261	205
158	1898	1894	236	203	173	262	206
159	1899	1895	237	204	174	264	207
160	1900	1896	238	205	175	265	208
161	1901	1897	239	206	176	266	209
162	1903	1899	240	207	177	268	210
163	1904	1900	242	208	177	269	212
164	1905	1902	243	209	178	271	213
165	1906	1904	244	210	179	272	214
166	1908	1904	245	211	180	273	215
167	1909	1903	246	212	181	275	216
168	1910	1903	248	213	182	276	217
169	1911	1904	249	214	183	278	218
170	1913	1906	250	215	184	279	219
171	1914	1908	251	216	184	280	220

Time (min)	E119 Std (°F)	Furnace Avg (°F)	Conduit #1 Bare #8 Maximum Temp (°F)	Conduit #1 Bare #8 Average Temp (°F)	Conduit #1 Bare #8 Minimum Temp (°F)	Conduit #1 Surface Maximum Temp (°F)	Conduit #1 Surface Average Temp (°F)
172	1915	1907	252	217	185	282	221
173	1916	1908	254	218	185	283	222
174	1918	1911	255	219	186	285	223
175	1919	1914	256	220	186	286	224
176	1920	1916	257	221	185	287	225
177	1921	1919	259	222	185	289	227
178	1923	1921	260	223	183	290	228
179	1924	1922	261	224	186	292	229
180	1925	1922	262	226	186	293	230

Time (min)	Conduit #1 Surface Minimum Temp (°F)	Conduit #2 Bare #8 Maximum Temp (°F)	Conduit #2 Bare #8 Average Temp (°F)	Conduit #2 Bare #8 Minimum Temp (°F)	Conduit #2 Surface Maximum Temp (°F)	Conduit #2 Surface Average Temp (°F)
0	59	70	67	66	63	62
1	59	70	67	66	63	62
2	60	70	67	66	64	63
3	61	70	67	66	64	63
4	60	70	67	66	64	63
5	60	70	67	66	64	63
6	60	71	67	66	64	63
7	60	71	67	66	64	63
8	60	71	67	66	64	63
9	60	71	67	66	64	63
10	60	71	67	66	64	63
11	61	71	67	66	64	63
12	59	71	67	66	63	61
13	54	71	67	66	60	57
14	55	71	67	66	60	57
15	60	71	67	66	64	63
16	60	71	67	66	65	63
17	60	71	67	66	65	63
18	61	71	67	66	66	63
19	61	71	67	66	68	63
20	61	71	67	66	69	64
21	61	71	67	66	70	64
22	61	71	67	66	71	64
23	61	71	68	66	73	64
24	61	71	68	66	74	65
25	61	71	68	66	75	65
26	61	71	68	66	77	65
27	61	71	68	66	78	65
28	61	72	68	66	79	66
29	61	72	69	66	80	66
30	61	73	69	66	82	66
31	61	74	69	66	83	66
32	61	74	69	66	85	67
33	61	75	69	66	86	67
34	61	75	70	66	87	67
35	61	76	70	66	89	68
36	61	77	70	66	91	68
37	61	78	71	66	94	69
38	61	79	71	66	96	69
39	61	80	71	67	98	70
40	61	81	72	67	101	70
41	61	82	72	67	103	71
42	62	83	73	67	105	71

OMEGA POINT LABORATORIES

Time (min)	Conduit #1 Surface Minimum Temp (°F)	Conduit #2 Bare #8 Maximum Temp (°F)	Conduit #2 Bare #8 Average Temp (°F)	Conduit #2 Bare #8 Minimum Temp (°F)	Conduit #2 Surface Maximum Temp (°F)	Conduit #2 Surface Average Temp (°F)
43	62	84	73	67	107	72
44	62	85	74	67	109	72
45	62	86	74	67	111	73
46	62	88	75	67	113	74
47	62	89	75	67	115	74
48	63	90	76	67	116	75
49	63	91	77	68	118	76
50	64	92	77	68	120	77
51	64	93	78	68	121	77
52	64	94	78	68	123	78
53	64	95	79	68	124	79
54	65	96	80	69	125	79
55	65	97	80	69	127	80
56	66	98	81	69	128	81
57	66	99	82	69	129	82
58	67	100	82	70	130	82
59	67	101	83	70	131	83
60	68	102	84	70	133	84
61	68	103	84	70	134	85
62	69	104	85	71	135	86
63	69	105	86	71	137	86
64	70	106	87	72	138	87
65	70	107	87	72	140	88
66	71	109	88	72	142	89
67	72	110	89	73	143	90
68	72	111	90	73	145	91
69	73	112	91	74	146	92
70	74	113	91	74	148	93
71	75	114	92	75	150	94
72	76	116	93	75	152	95
73	76	117	94	76	155	95
74	77	119	95	77	157	97
75	78	120	96	77	159	98
76	79	122	97	78	161	99
77	80	123	98	79	162	100
78	81	125	99	79	164	101
79	82	127	100	80	166	102
80	83	128	101	81	167	103
81	83	130	102	82	169	104
82	85	132	103	82	170	106
83	86	133	104	83	171	107
84	86	135	105	84	172	108
85	87	137	106	85	173	109

Time (min)	Conduit #1 Surface Minimum Temp (°F)	Conduit #2 Bare #8 Maximum Temp (°F)	Conduit #2 Bare #8 Average Temp (°F)	Conduit #2 Bare #8 Minimum Temp (°F)	Conduit #2 Surface Maximum Temp (°F)	Conduit #2 Surface Average Temp (°F)
86	88	138	107	86	174	110
87	89	140	108	86	175	111
88	90	142	109	87	175	112
89	91	143	110	88	176	114
90	92	144	111	89	177	115
91	93	146	112	90	177	116
92	94	147	113	91	178	117
93	94	149	115	91	178	118
94	95	150	116	92	178	120
95	96	151	117	93	179	121
96	98	152	118	93	179	122
97	98	153	119	94	179	123
98	99	154	120	95	180	125
99	101	156	122	95	180	126
100	101	157	123	96	180	127
101	102	158	124	97	180	128
102	104	159	125	97	181	130
103	105	160	126	98	181	131
104	105	161	128	99	181	132
105	107	162	129	99	182	134
106	108	163	130	100	182	135
107	109	164	131	101	182	136
108	110	165	133	102	183	137
109	112	166	134	103	185	139
110	113	167	135	103	187	140
111	114	168	136	104	189	142
112	115	169	138	105	190	143
113	116	170	139	106	192	144
114	117	171	140	107	193	145
115	118	172	141	108	194	147
116	120	172	142	109	195	148
117	120	173	144	110	197	149
118	122	174	145	110	199	151
119	123	175	146	112	199	151
120	124	176	147	112	201	153
121	125	177	149	114	202	154
122	126	178	150	115	203	155
123	128	179	151	116	204	157
124	129	180	152	117	205	158
125	131	182	154	118	206	160
126	132	183	155	120	207	161
127	133	185	156	121	206	162
128	134	186	157	123	206	162

Time (min)	Conduit #1 Surface Minimum Temp (°F)	Conduit #2 Bare #8 Maximum Temp (°F)	Conduit #2 Bare #8 Average Temp (°F)	Conduit #2 Bare #8 Minimum Temp (°F)	Conduit #2 Surface Maximum Temp (°F)	Conduit #2 Surface Average Temp (°F)
129	136	187	159	124	207	164
130	137	189	160	125	208	165
131	139	190	161	127	208	167
132	140	191	162	128	208	168
133	142	192	163	130	208	169
134	143	193	165	131	208	170
135	144	194	166	132	208	171
136	146	195	167	133	208	172
137	145	196	168	133	206	171
138	147	197	169	134	206	172
139	148	198	170	134	206	173
140	150	198	171	135	206	174
141	151	199	173	136	206	175
142	153	200	174	139	206	176
143	154	201	175	141	206	177
144	156	201	176	141	206	178
145	157	202	177	142	206	179
146	159	203	178	144	207	180
147	160	203	179	146	207	181
148	162	204	180	146	207	182
149	163	204	181	149	208	182
150	164	205	182	150	208	183
151	166	206	183	152	209	184
152	167	206	184	154	209	185
153	168	207	185	156	210	185
154	169	207	186	156	211	186
155	171	208	187	158	212	187
156	171	209	188	160	212	187
157	173	209	189	160	213	188
158	174	210	190	162	214	189
159	175	211	191	161	215	190
160	176	211	192	162	216	191
161	177	212	193	164	217	191
162	179	212	193	165	218	193
163	180	213	194	166	219	193
164	180	214	195	166	219	194
165	181	215	196	168	221	195
166	182	215	197	169	221	195
167	183	216	197	169	222	195
168	184	217	198	172	223	196
169	185	217	199	174	224	197
170	185	218	200	175	225	197
171	186	217	199	174	223	197

Time (min)	Conduit #1 Surface Minimum Temp (°F)	Conduit #2 Bare #8 Maximum Temp (°F)	Conduit #2 Bare #8 Average Temp (°F)	Conduit #2 Bare #8 Minimum Temp (°F)	Conduit #2 Surface Maximum Temp (°F)	Conduit #2 Surface Average Temp (°F)
172	187	217	200	177	217	197
173	188	217	200	175	221	198
174	188	217	201	176	223	199
175	189	219	202	178	225	199
176	190	220	202	176	226	200
177	190	222	203	178	228	201
178	191	223	204	179	229	202
179	192	224	204	181	231	202
180	193	226	204	180	232	203

Time (min)	Conduit #2 Surface Minimum Temp (°F)	Conduit #3 Bare #8 Maximum Temp (°F)	Conduit #3 Bare #8 Average Temp (°F)	Conduit #3 Bare #8 Minimum Temp (°F)	Conduit #3 Surface Maximum Temp (°F)	Conduit #3 Surface Average Temp (°F)
0	61	69	67	66	67	64
1	61	69	67	66	68	64
2	62	69	67	66	68	65
3	62	69	67	66	68	65
4	62	69	67	66	68	65
5	62	69	67	66	68	65
6	62	69	67	66	68	65
7	62	69	67	66	68	65
8	62	69	67	66	68	65
9	62	69	67	66	68	65
10	62	69	67	66	68	65
11	62	69	67	66	68	65
12	60	69	67	66	67	64
13	55	69	67	66	64	60
14	56	70	67	66	64	60
15	61	70	67	66	68	65
16	62	70	67	66	69	65
17	62	70	67	66	70	66
18	62	71	68	66	72	66
19	62	72	68	66	74	66
20	62	73	68	66	76	66
21	62	74	68	66	78	67
22	62	76	68	66	80	67
23	62	77	69	66	82	67
24	62	78	69	66	84	68
25	62	80	69	66	86	68
26	62	81	69	66	88	69
27	63	83	70	66	90	69
28	62	84	70	66	92	69
29	62	86	70	66	94	70
30	63	87	70	66	97	70
31	63	89	71	67	99	71
32	62	90	71	67	101	71
33	62	92	71	67	103	72
34	62	93	72	67	105	72
35	63	95	72	67	107	73
36	63	97	73	67	110	73
37	63	98	73	67	112	74
38	63	99	74	67	114	74
39	63	101	74	67	115	75
40	63	102	74	67	117	76
41	63	104	75	67	119	76
42	63	105	75	67	121	77

Time (min)	Conduit #2 Surface Minimum Temp (°F)	Conduit #3 Bare #8 Maximum Temp (°F)	Conduit #3 Bare #8 Average Temp (°F)	Conduit #3 Bare #8 Minimum Temp (°F)	Conduit #3 Surface Maximum Temp (°F)	Conduit #3 Surface Average Temp (°F)
43	63	106	76	67	122	78
44	63	108	76	67	124	79
45	63	109	77	67	126	79
46	63	111	78	67	128	80
47	64	112	78	68	130	81
48	64	114	79	68	133	82
49	64	115	80	68	135	83
50	64	117	81	68	137	84
51	64	118	81	68	139	86
52	65	119	82	69	140	87
53	65	121	83	69	142	88
54	65	122	84	69	143	89
55	66	123	85	70	145	90
56	66	124	86	70	146	91
57	66	126	86	71	148	92
58	67	127	87	71	149	93
59	67	128	88	72	150	94
60	68	129	89	72	151	96
61	68	130	90	73	152	97
62	68	130	91	73	153	98
63	69	131	92	74	154	99
64	69	132	93	74	157	100
65	69	133	94	74	159	102
66	70	134	95	75	161	103
67	71	135	97	75	163	104
68	71	136	98	76	165	105
69	72	137	99	76	167	107
70	72	137	100	77	168	108
71	73	138	101	77	169	109
72	74	139	102	78	170	110
73	74	140	103	78	171	112
74	75	141	104	79	172	113
75	76	142	106	79	173	114
76	77	142	107	80	174	115
77	77	143	108	80	174	116
78	78	144	109	81	176	118
79	79	145	110	82	177	119
80	80	145	111	82	178	120
81	80	146	113	83	179	121
82	81	147	114	83	180	123
83	82	148	115	84	181	124
84	83	148	116	85	182	125
85	84	149	117	85	183	126

Time (min)	Conduit #2 Surface Minimum Temp (°F)	Conduit #3 Bare #8 Maximum Temp (°F)	Conduit #3 Bare #8 Average Temp (°F)	Conduit #3 Bare #8 Minimum Temp (°F)	Conduit #3 Surface Maximum Temp (°F)	Conduit #3 Surface Average Temp (°F)
86	85	150	118	86	184	127
87	86	150	119	86	184	128
88	86	151	120	87	185	129
89	87	152	121	88	186	130
90	88	154	123	88	187	131
91	89	155	124	89	188	132
92	90	156	125	89	188	133
93	91	157	126	90	189	134
94	92	158	127	91	189	135
95	93	159	128	91	190	137
96	94	160	129	92	191	138
97	95	162	130	93	192	139
98	96	163	131	93	193	140
99	97	164	132	94	194	141
100	98	165	133	95	194	142
101	99	166	134	95	195	143
102	100	167	135	96	196	144
103	101	168	137	97	197	145
104	102	169	138	97	198	146
105	103	170	139	98	199	147
106	104	171	140	99	200	149
107	105	171	141	100	200	150
108	106	172	142	101	201	151
109	108	173	143	101	202	152
110	109	173	144	102	203	153
111	110	175	145	103	203	154
112	112	176	146	104	204	155
113	113	177	147	105	205	156
114	114	179	148	106	205	157
115	115	180	149	107	206	158
116	116	181	150	108	206	159
117	117	183	151	108	206	159
118	119	184	152	109	208	161
119	119	185	153	110	208	161
120	121	187	154	111	209	162
121	122	188	155	112	209	163
122	123	189	156	113	210	164
123	125	190	157	114	211	166
124	126	191	158	115	212	167
125	128	192	159	116	213	168
126	130	193	160	117	214	169
127	130	194	161	118	214	170
128	131	195	162	119	215	171

Time (min)	Conduit #2 Surface Minimum Temp (°F)	Conduit #3 Bare #8 Maximum Temp (°F)	Conduit #3 Bare #8 Average Temp (°F)	Conduit #3 Bare #8 Minimum Temp (°F)	Conduit #3 Surface Maximum Temp (°F)	Conduit #3 Surface Average Temp (°F)
129	134	196	163	121	216	172
130	135	197	164	122	217	173
131	136	198	165	123	217	175
132	138	199	166	125	218	176
133	139	200	168	126	219	177
134	141	201	169	127	220	178
135	142	202	170	129	220	179
136	143	203	171	130	221	180
137	143	204	172	131	220	179
138	144	205	173	133	221	180
139	146	206	174	134	222	181
140	147	206	175	136	223	182
141	149	207	176	137	224	183
142	151	208	177	138	225	184
143	152	209	178	139	225	185
144	153	210	179	140	226	186
145	155	211	180	141	227	187
146	156	211	181	142	228	188
147	157	212	182	143	229	189
148	158	213	183	144	230	190
149	158	214	184	146	231	191
150	159	215	185	149	232	192
151	160	216	187	155	233	193
152	161	216	187	156	234	193
153	162	217	188	158	235	194
154	162	218	189	159	236	195
155	163	219	190	159	237	195
156	164	220	191	159	237	196
157	165	220	192	160	238	196
158	166	221	193	161	240	197
159	167	222	194	164	241	198
160	168	223	194	163	242	199
161	168	224	195	164	243	200
162	170	224	196	163	244	201
163	170	225	196	162	245	201
164	170	226	197	163	246	202
165	171	227	197	164	247	203
166	172	227	198	163	249	204
167	173	228	199	163	250	204
168	174	229	200	167	251	205
169	174	230	200	166	252	206
170	175	231	201	168	253	207
171	176	232	202	169	254	208

Time (min)	Conduit #2 Surface Minimum Temp (°F)	Conduit #3 Bare #8 Maximum Temp (°F)	Conduit #3 Bare #8 Average Temp (°F)	Conduit #3 Bare #8 Minimum Temp (°F)	Conduit #3 Surface Maximum Temp (°F)	Conduit #3 Surface Average Temp (°F)
172	176	232	202	170	255	208
173	177	233	203	171	256	209
174	177	234	204	173	257	210
175	178	235	204	172	258	211
176	178	236	205	171	259	212
177	179	237	206	175	260	213
178	180	238	206	177	261	213
179	181	239	207	174	263	214
180	182	240	208	174	264	215

Time (min)	Conduit #3 Surface Minimum Temp (°F)	Conduit #4 Bare #8 Maximum Temp (°F)	Conduit #4 Bare #8 Average Temp (°F)	Conduit #4 Bare #8 Minimum Temp (°F)	Conduit #4 Surface Maximum Temp (°F)	Conduit #4 Surface Average Temp (°F)
0	63	72	67	66	65	62
1	63	72	67	66	65	62
2	64	72	67	66	66	63
3	64	72	67	66	66	63
4	64	72	67	66	66	63
5	64	72	67	66	66	63
6	64	72	67	66	66	63
7	64	72	67	66	66	63
8	64	72	67	66	66	63
9	64	72	67	66	66	63
10	64	72	67	66	70	63
11	64	72	67	66	75	64
12	63	72	67	66	78	62
13	58	72	67	66	77	59
14	58	72	67	67	81	59
15	64	72	68	67	88	64
16	64	72	68	67	91	65
17	64	72	68	67	94	65
18	64	73	68	67	97	65
19	64	73	68	67	100	66
20	64	73	68	67	103	66
21	64	74	68	67	106	66
22	64	75	68	67	108	66
23	64	76	69	67	111	67
24	64	77	69	67	113	67
25	64	79	69	67	115	67
26	64	80	69	67	117	68
27	64	81	69	67	119	68
28	64	82	70	67	120	68
29	64	83	70	67	121	68
30	64	83	70	67	122	69
31	64	84	70	67	123	69
32	64	85	70	67	123	69
33	64	86	71	67	122	69
34	64	87	71	67	122	69
35	64	87	71	67	120	70
36	64	88	71	67	119	70
37	65	88	71	67	117	70
38	65	89	72	67	115	70
39	65	89	72	67	114	70
40	65	89	72	67	112	70
41	65	89	72	67	112	71
42	65	90	73	67	111	71

Time (min)	Conduit #3 Surface Minimum Temp (°F)	Conduit #4 Bare #8 Maximum Temp (°F)	Conduit #4 Bare #8 Average Temp (°F)	Conduit #4 Bare #8 Minimum Temp (°F)	Conduit #4 Surface Maximum Temp (°F)	Conduit #4 Surface Average Temp (°F)
43	65	90	73	67	111	71
44	65	90	73	67	111	71
45	65	91	73	67	111	72
46	65	91	74	67	111	72
47	65	91	74	67	111	73
48	66	92	74	67	112	73
49	66	92	75	68	112	74
50	66	92	75	68	112	74
51	66	93	75	68	113	75
52	67	93	76	68	113	76
53	67	94	76	68	114	76
54	68	94	77	68	114	77
55	68	95	77	69	115	78
56	68	95	78	69	116	78
57	69	96	78	69	116	79
58	70	97	79	69	117	80
59	70	97	80	69	118	80
60	71	98	80	70	119	81
61	72	99	81	70	120	82
62	72	100	81	70	121	83
63	73	101	82	71	122	84
64	74	103	83	71	122	84
65	74	105	83	71	123	85
66	75	107	84	72	125	86
67	76	108	85	72	127	87
68	77	110	86	72	129	88
69	78	111	86	73	131	89
70	78	113	87	73	133	90
71	79	114	88	73	136	91
72	80	116	89	73	139	92
73	81	117	90	74	142	93
74	81	118	90	74	145	94
75	82	120	91	74	147	95
76	83	121	92	74	149	96
77	83	122	93	75	152	97
78	84	123	94	75	154	98
79	85	125	95	75	156	100
80	86	126	96	75	157	101
81	87	127	97	75	159	102
82	88	128	98	76	160	103
83	88	129	99	76	161	104
84	89	130	100	76	162	105
85	90	132	101	76	163	107

Time (min)	Conduit #3 Surface Minimum Temp (°F)	Conduit #4 Bare #8 Maximum Temp (°F)	Conduit #4 Bare #8 Average Temp (°F)	Conduit #4 Bare #8 Minimum Temp (°F)	Conduit #4 Surface Maximum Temp (°F)	Conduit #4 Surface Average Temp (°F)
86	90	133	102	76	164	108
87	91	134	103	76	165	109
88	92	135	104	77	166	110
89	93	137	105	77	166	111
90	93	139	106	77	167	112
91	94	140	107	77	168	114
92	95	142	108	77	168	115
93	96	144	109	78	169	116
94	96	145	110	78	169	117
95	98	146	111	78	170	118
96	98	148	112	78	171	120
97	99	149	114	78	171	121
98	100	150	115	79	171	122
99	101	151	116	79	172	123
100	102	153	117	79	173	125
101	103	154	118	79	173	126
102	104	155	120	79	174	127
103	105	157	121	80	176	128
104	106	158	122	80	177	130
105	107	159	123	80	178	131
106	108	160	124	81	179	132
107	110	161	126	81	181	133
108	111	162	127	81	182	134
109	112	163	128	81	184	136
110	113	164	129	82	185	137
111	115	165	130	82	187	138
112	116	166	132	82	188	140
113	117	167	133	83	189	141
114	119	168	134	83	190	142
115	120	169	135	83	191	143
116	121	170	136	83	192	144
117	122	171	137	84	193	145
118	124	172	139	84	195	147
119	125	173	140	85	195	148
120	126	174	141	85	197	149
121	127	175	142	85	198	150
122	128	176	143	85	199	151
123	129	177	144	86	200	153
124	131	178	146	86	201	154
125	132	179	147	87	203	155
126	134	180	148	87	203	157
127	135	181	149	88	203	157
128	136	182	150	88	204	158

Time (min)	Conduit #3 Surface Minimum Temp (°F)	Conduit #4 Bare #8 Maximum Temp (°F)	Conduit #4 Bare #8 Average Temp (°F)	Conduit #4 Bare #8 Minimum Temp (°F)	Conduit #4 Surface Maximum Temp (°F)	Conduit #4 Surface Average Temp (°F)
129	138	184	151	88	205	160
130	139	185	153	90	205	161
131	141	186	154	90	206	162
132	142	187	155	91	206	163
133	144	188	157	92	206	164
134	145	188	158	94	206	166
135	147	189	159	93	206	166
136	148	190	160	95	206	167
137	148	191	162	96	204	167
138	149	192	163	97	204	168
139	151	192	164	99	204	169
140	152	193	165	100	205	170
141	154	194	166	101	205	171
142	155	194	168	102	205	172
143	157	195	169	102	205	173
144	158	196	170	103	205	174
145	160	196	171	104	205	175
146	161	197	172	106	205	176
147	162	198	173	108	205	177
148	164	198	174	108	205	177
149	165	199	175	108	205	178
150	166	199	176	110	205	179
151	168	200	177	112	205	180
152	169	200	178	112	205	180
153	170	201	179	114	205	181
154	171	201	180	115	205	181
155	172	202	180	115	205	182
156	172	202	181	116	205	183
157	173	203	182	119	205	183
158	174	203	183	118	205	184
159	174	204	184	119	205	185
160	175	205	185	122	205	185
161	176	206	185	122	205	186
162	177	206	186	124	206	187
163	177	207	187	125	206	187
164	178	208	188	126	206	188
165	178	208	189	126	206	189
166	180	209	189	127	206	189
167	180	210	190	127	206	190
168	181	210	190	134	206	190
169	181	211	191	130	206	191
170	182	212	192	131	206	191
171	183	212	192	134	206	192

Time (min)	Conduit #3 Surface Minimum Temp (°F)	Conduit #4 Bare #8 Maximum Temp (°F)	Conduit #4 Bare #8 Average Temp (°F)	Conduit #4 Bare #8 Minimum Temp (°F)	Conduit #4 Surface Maximum Temp (°F)	Conduit #4 Surface Average Temp (°F)
172	183	213	193	135	206	192
173	185	214	193	135	205	193
174	184	214	194	137	205	193
175	185	215	195	139	205	194
176	187	215	195	139	205	195
177	187	216	195	140	206	195
178	188	216	196	140	207	196
179	189	217	196	143	207	196
180	190	217	197	143	208	197

Time (min)	Conduit #4 Surface Minimum Temp (°F)	Conduit #5 Bare #8 Maximum Temp (°F)	Conduit #5 Bare #8 Average Temp (°F)	Conduit #5 Bare #8 Minimum Temp (°F)	Conduit #5 Surface Maximum Temp (°F)	Conduit #5 Surface Average Temp (°F)
0	61	69	67	66	65	63
1	61	69	67	66	65	63
2	62	69	67	66	66	64
3	62	69	67	66	66	65
4	62	69	67	66	66	64
5	62	69	67	66	66	64
6	62	69	67	66	66	64
7	62	69	67	66	66	64
8	62	69	67	66	66	64
9	62	69	67	66	66	64
10	62	69	67	66	66	65
11	62	69	67	66	68	65
12	60	69	67	66	70	64
13	56	70	67	66	70	60
14	56	71	67	66	75	61
15	62	73	67	66	86	66
16	62	75	68	66	91	67
17	62	77	68	66	97	67
18	62	79	68	66	102	68
19	62	82	68	66	107	69
20	62	84	69	66	110	69
21	62	86	69	66	113	70
22	62	89	70	66	115	70
23	62	91	70	66	117	71
24	62	92	70	66	119	72
25	62	94	71	66	120	72
26	62	96	71	66	121	73
27	62	98	72	66	122	73
28	62	99	72	66	123	74
29	62	100	72	66	124	75
30	62	102	73	66	124	76
31	62	103	73	66	125	76
32	62	104	74	66	126	77
33	62	105	74	66	126	77
34	62	106	75	66	126	78
35	62	107	75	66	126	79
36	62	108	76	66	129	79
37	63	108	76	67	132	80
38	62	109	77	67	134	80
39	62	109	77	67	136	81
40	62	110	78	67	138	81
41	62	111	78	67	140	82
42	62	111	79	67	142	83

Time (min)	Conduit #4 Surface Minimum Temp (°F)	Conduit #5 Bare #8 Maximum Temp (°F)	Conduit #5 Bare #8 Average Temp (°F)	Conduit #5 Bare #8 Minimum Temp (°F)	Conduit #5 Surface Maximum Temp (°F)	Conduit #5 Surface Average Temp (°F)
43	62	112	80	67	144	83
44	62	113	80	67	145	84
45	62	114	81	68	147	85
46	63	115	82	68	148	86
47	63	116	82	68	150	87
48	63	117	83	68	151	88
49	63	118	84	68	152	89
50	63	119	85	69	153	89
51	63	120	85	69	155	90
52	64	121	86	69	156	91
53	64	121	87	70	157	92
54	64	122	88	70	158	93
55	64	124	89	71	159	94
56	64	125	89	71	160	95
57	65	126	90	71	161	96
58	65	127	91	72	162	97
59	65	127	92	72	163	98
60	66	128	93	73	164	99
61	66	130	94	73	165	100
62	66	130	95	74	166	101
63	67	132	96	75	167	102
64	67	133	97	75	167	104
65	68	134	98	76	167	105
66	68	135	99	77	168	106
67	69	136	100	77	169	107
68	69	137	101	78	170	108
69	70	138	102	79	171	109
70	70	139	103	80	172	110
71	71	140	104	80	173	112
72	72	141	105	81	174	113
73	72	142	106	82	175	114
74	73	142	108	83	176	116
75	73	143	109	84	177	117
76	74	144	110	84	178	118
77	75	145	111	85	178	119
78	75	146	112	86	179	120
79	76	147	113	87	180	122
80	77	149	115	88	181	123
81	77	150	116	89	182	124
82	78	151	117	90	183	126
83	78	152	118	91	184	127
84	79	153	119	92	185	128
85	79	154	121	93	186	129

Time (min)	Conduit #4 Surface Minimum Temp (°F)	Conduit #5 Bare #8 Maximum Temp (°F)	Conduit #5 Bare #8 Average Temp (°F)	Conduit #5 Bare #8 Minimum Temp (°F)	Conduit #5 Surface Maximum Temp (°F)	Conduit #5 Surface Average Temp (°F)
86	80	155	122	94	186	131
87	81	156	123	94	187	132
88	81	157	124	95	188	133
89	82	158	125	96	190	134
90	83	159	127	97	192	136
91	83	160	128	97	193	137
92	83	161	129	98	193	138
93	84	162	130	99	194	139
94	85	163	131	99	195	140
95	85	164	132	100	196	141
96	86	165	134	101	197	142
97	87	166	135	102	198	143
98	87	167	136	102	199	144
99	88	168	137	103	200	146
100	89	169	138	104	200	147
101	89	169	139	105	201	148
102	90	170	140	105	202	149
103	91	171	141	106	203	150
104	92	172	143	107	204	151
105	92	173	144	108	205	153
106	93	174	145	108	205	154
107	94	175	146	109	206	155
108	95	177	147	110	207	156
109	96	178	148	111	208	157
110	97	179	149	112	209	158
111	98	181	150	113	210	159
112	99	182	151	114	211	160
113	100	184	153	115	212	161
114	101	185	154	116	213	162
115	101	186	155	116	213	163
116	102	188	156	118	214	164
117	103	189	157	119	215	165
118	104	190	158	120	216	166
119	105	191	159	121	216	167
120	106	193	160	122	218	168
121	107	194	161	123	219	169
122	108	196	162	124	220	170
123	109	197	163	125	222	171
124	111	198	164	126	223	173
125	112	199	165	127	225	174
126	114	200	166	129	226	175
127	114	202	167	130	227	176
128	116	203	168	131	228	176

Time (min)	Conduit #4 Surface Minimum Temp (°F)	Conduit #5 Bare #8 Maximum Temp (°F)	Conduit #5 Bare #8 Average Temp (°F)	Conduit #5 Bare #8 Minimum Temp (°F)	Conduit #5 Surface Maximum Temp (°F)	Conduit #5 Surface Average Temp (°F)
129	117	204	169	132	230	178
130	119	206	170	134	231	179
131	121	207	171	135	232	180
132	122	208	172	136	233	181
133	123	209	173	138	234	182
134	125	211	174	139	235	183
135	127	212	175	140	237	184
136	128	213	176	141	238	185
137	128	214	177	143	237	184
138	131	215	178	144	238	185
139	132	216	179	145	239	186
140	134	218	180	146	240	188
141	136	219	182	147	242	189
142	138	220	183	148	243	190
143	140	222	184	149	244	191
144	141	223	185	150	245	192
145	143	224	186	151	246	193
146	144	225	187	151	247	194
147	145	226	188	151	248	195
148	145	227	189	153	249	196
149	145	229	190	153	250	197
150	146	230	191	154	252	198
151	147	231	192	156	253	199
152	147	232	193	157	254	200
153	148	233	193	158	255	200
154	149	234	194	159	256	201
155	150	235	195	162	257	202
156	151	236	196	162	258	203
157	152	237	197	164	259	204
158	153	238	198	166	260	205
159	154	239	199	166	261	206
160	155	241	200	168	263	207
161	156	242	200	169	264	208
162	157	243	201	170	265	209
163	158	244	202	171	267	210
164	159	245	203	172	268	211
165	160	246	204	172	269	212
166	161	247	204	174	270	213
167	163	248	205	173	271	214
168	163	249	206	173	272	215
169	164	250	207	174	273	216
170	165	251	208	174	275	217
171	165	252	209	175	276	218

Time (min)	Conduit #4 Surface Minimum Temp (°F)	Conduit #5 Bare #8 Maximum Temp (°F)	Conduit #5 Bare #8 Average Temp (°F)	Conduit #5 Bare #8 Minimum Temp (°F)	Conduit #5 Surface Maximum Temp (°F)	Conduit #5 Surface Average Temp (°F)
172	166	254	209	174	277	219
173	168	255	210	174	278	220
174	168	256	211	175	279	221
175	170	257	212	174	281	222
176	171	258	213	174	282	224
177	171	259	213	174	283	225
178	172	260	214	173	285	226
179	173	261	215	174	286	227
180	174	262	216	173	287	228

Time (min)	Conduit #5 Surface Minimum Temp (°F)	Conduit #6 Bare #8 Maximum Temp (°F)	Conduit #6 Bare #8 Average Temp (°F)	Conduit #6 Bare #8 Minimum Temp (°F)	Conduit #6 Surface Maximum Temp (°F)	Conduit #6 Surface Average Temp (°F)
0	62	71	67	66	63	61
1	62	71	67	66	63	61
2	63	71	67	66	64	62
3	64	71	67	66	64	62
4	63	71	67	66	64	62
5	63	71	67	66	64	62
6	63	71	67	66	64	62
7	63	71	67	66	64	62
8	63	71	67	66	64	62
9	63	71	67	66	64	62
10	63	71	67	66	64	62
11	64	71	67	66	66	62
12	62	71	67	66	66	60
13	58	71	67	66	66	57
14	58	71	67	66	69	57
15	63	72	67	66	78	63
16	64	72	67	66	81	63
17	64	72	67	66	83	63
18	64	72	68	66	86	63
19	64	72	68	66	89	64
20	64	73	68	66	90	64
21	64	73	68	66	91	64
22	64	74	68	66	93	65
23	64	75	68	66	94	65
24	64	76	68	66	95	65
25	64	77	69	66	96	65
26	64	78	69	66	97	66
27	65	78	69	66	98	66
28	64	79	69	66	99	66
29	64	80	69	66	100	66
30	65	80	70	66	101	67
31	65	81	70	66	103	67
32	65	82	70	66	103	67
33	65	82	70	66	105	68
34	65	83	71	66	105	68
35	65	84	71	66	106	68
36	65	84	71	66	107	69
37	66	85	71	66	108	69
38	65	85	72	66	108	69
39	65	86	72	67	109	70
40	66	87	72	67	109	70
41	66	87	73	67	110	71
42	66	88	73	67	110	72

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Time (min)	Conduit #5 Surface Minimum Temp (°F)	Conduit #6 Bare #8 Maximum Temp (°F)	Conduit #6 Bare #8 Average Temp (°F)	Conduit #6 Bare #8 Minimum Temp (°F)	Conduit #6 Surface Maximum Temp (°F)	Conduit #6 Surface Average Temp (°F)
43	66	89	74	67	111	72
44	66	89	74	67	112	73
45	66	90	75	68	113	74
46	67	91	75	68	114	74
47	67	91	76	68	116	75
48	67	92	76	68	117	76
49	67	93	77	68	118	77
50	68	94	77	68	119	78
51	68	95	78	69	121	79
52	68	96	79	69	123	79
53	69	97	79	69	125	80
54	69	98	80	69	128	81
55	70	99	80	70	131	82
56	70	99	81	70	133	83
57	71	100	82	70	135	83
58	71	101	82	70	137	84
59	72	102	83	71	138	85
60	72	103	84	71	140	86
61	73	104	84	71	141	86
62	73	105	85	72	142	87
63	74	106	86	72	143	88
64	75	107	87	73	144	89
65	75	108	87	73	144	90
66	76	109	88	73	145	90
67	77	110	89	74	146	91
68	78	111	90	75	147	92
69	79	112	91	75	148	93
70	79	113	91	76	149	94
71	80	114	92	76	150	95
72	81	115	93	77	151	96
73	82	116	94	77	152	97
74	83	117	95	78	153	98
75	84	118	96	79	155	99
76	85	119	97	79	156	100
77	86	120	98	80	157	101
78	87	121	99	81	158	102
79	88	122	100	82	159	103
80	89	123	101	82	160	104
81	90	124	102	83	161	105
82	91	125	103	84	163	107
83	92	127	104	85	164	108
84	93	128	105	86	166	109
85	94	130	106	86	167	110

Time (min)	Conduit #5 Surface Minimum Temp (°F)	Conduit #6 Bare #8 Maximum Temp (°F)	Conduit #6 Bare #8 Average Temp (°F)	Conduit #6 Bare #8 Minimum Temp (°F)	Conduit #6 Surface Maximum Temp (°F)	Conduit #6 Surface Average Temp (°F)
86	95	132	107	86	168	111
87	96	134	108	87	169	112
88	97	136	109	87	170	113
89	98	138	110	88	171	114
90	99	140	111	88	172	116
91	100	141	112	89	173	117
92	101	143	113	89	173	118
93	102	144	114	90	174	119
94	102	146	116	90	175	120
95	104	147	117	91	175	121
96	105	149	118	91	176	123
97	106	150	119	91	177	124
98	107	152	120	92	178	125
99	108	153	121	92	179	126
100	109	155	122	93	180	127
101	110	156	124	93	182	129
102	111	157	125	94	183	130
103	112	158	126	94	184	131
104	113	159	127	95	185	132
105	114	160	128	95	186	134
106	115	161	129	95	187	135
107	116	162	131	96	188	136
108	117	163	132	96	189	137
109	119	164	133	97	191	139
110	120	165	134	97	192	140
111	121	166	135	98	194	141
112	122	168	137	98	195	143
113	124	169	138	98	197	144
114	125	170	139	99	198	145
115	125	172	140	99	198	146
116	127	173	141	100	200	147
117	127	174	143	100	200	148
118	129	175	144	101	202	150
119	130	176	145	101	202	150
120	131	176	146	102	203	152
121	132	177	147	102	204	153
122	133	179	148	102	204	154
123	135	180	150	103	205	155
124	136	182	151	103	206	156
125	137	183	152	104	206	158
126	138	184	153	104	207	159
127	139	186	154	105	206	160
128	140	187	155	105	206	161

Time (min)	Conduit #5 Surface Minimum Temp (°F)	Conduit #6 Bare #8 Maximum Temp (°F)	Conduit #6 Bare #8 Average Temp (°F)	Conduit #6 Bare #8 Minimum Temp (°F)	Conduit #6 Surface Maximum Temp (°F)	Conduit #6 Surface Average Temp (°F)
129	142	188	157	106	207	162
130	143	189	158	106	207	163
131	145	190	159	107	208	165
132	146	191	160	107	207	166
133	147	192	161	108	208	167
134	149	193	162	108	208	168
135	150	194	163	109	207	169
136	151	194	164	109	207	170
137	151	195	166	110	206	169
138	152	196	167	110	206	170
139	153	197	168	111	206	171
140	155	198	169	111	206	172
141	156	198	170	112	206	173
142	158	199	171	112	206	174
143	159	200	172	113	206	175
144	160	200	173	114	206	176
145	162	201	174	115	206	177
146	163	202	175	116	206	178
147	164	202	176	117	206	179
148	166	203	177	117	206	180
149	167	203	178	119	207	181
150	168	204	179	120	207	182
151	170	205	180	121	207	182
152	171	205	181	123	207	183
153	172	206	182	124	207	184
154	174	206	183	125	208	185
155	175	207	184	127	208	185
156	176	208	185	129	208	186
157	177	208	186	130	209	186
158	178	209	187	133	209	187
159	179	209	188	134	210	188
160	180	210	189	136	211	189
161	181	211	190	138	212	189
162	183	211	191	140	213	190
163	184	212	191	142	214	191
164	185	212	192	145	215	191
165	186	213	193	147	216	192
166	187	214	194	148	216	193
167	188	214	195	151	217	194
168	189	215	196	152	218	194
169	190	215	196	154	219	195
170	190	216	197	156	220	196
171	191	217	198	157	221	196

Time (min)	Conduit #5 Surface Minimum Temp (°F)	Conduit #6 Bare #8 Maximum Temp (°F)	Conduit #6 Bare #8 Average Temp (°F)	Conduit #6 Bare #8 Minimum Temp (°F)	Conduit #6 Surface Maximum Temp (°F)	Conduit #6 Surface Average Temp (°F)
172	192	217	199	159	222	197
173	193	218	199	161	222	198
174	194	218	200	163	224	198
175	195	219	200	162	224	199
176	195	219	201	164	225	200
177	196	220	201	165	226	200
178	197	221	202	166	227	201
179	197	221	202	167	228	201
180	197	222	202	169	229	202

Time (min)	Conduit #6 Surface Minimum Temp (°F)	Conduit #9 Surface Maximum Temp (°F)	Conduit #9 Surface Average Temp (°F)	Conduit #9 Surface Minimum Temp (°F)	Conduit #10 Bare #8 Maximum Temp (°F)	Conduit #10 Bare #8 Average Temp (°F)
0	60	68	67	66	66	66
1	60	68	67	66	66	66
2	60	68	67	66	66	66
3	61	68	67	66	66	66
4	61	68	67	66	66	66
5	60	68	67	66	66	66
6	60	68	67	66	66	66
7	60	68	67	66	66	66
8	60	68	67	66	66	66
9	60	68	67	66	66	66
10	61	68	67	66	66	66
11	61	68	67	66	66	66
12	59	68	67	66	68	66
13	55	68	67	66	72	67
14	55	68	67	66	77	68
15	60	68	67	66	83	70
16	61	68	67	66	90	72
17	61	68	67	66	96	74
18	61	68	67	66	102	76
19	61	68	67	66	107	78
20	61	68	67	66	111	80
21	61	68	67	66	116	82
22	61	69	67	66	120	84
23	61	69	67	66	123	85
24	61	69	67	66	127	87
25	61	69	67	66	130	89
26	61	70	68	66	133	91
27	61	70	68	66	136	93
28	61	71	68	66	139	95
29	61	72	68	66	141	97
30	61	73	68	66	144	99
31	61	74	68	67	145	101
32	61	75	69	67	147	103
33	61	76	69	67	149	104
34	61	77	69	67	150	106
35	61	79	69	67	151	108
36	61	80	70	67	152	109
37	62	82	70	67	153	111
38	61	83	71	67	155	113
39	61	85	71	67	157	114
40	61	86	71	67	158	116
41	62	88	72	67	159	117
42	62	90	72	67	161	119

OMEGA POINT LABORATORIES

Time (min)	Conduit #6 Surface Minimum Temp (°F)	Conduit #9 Surface Maximum Temp (°F)	Conduit #9 Surface Average Temp (°F)	Conduit #9 Surface Minimum Temp (°F)	Conduit #10 Bare #8 Maximum Temp (°F)	Conduit #10 Bare #8 Average Temp (°F)
43	62	91	73	67	162	121
44	62	93	74	68	164	123
45	62	95	74	68	165	124
46	62	96	75	68	166	126
47	63	98	76	68	168	128
48	63	100	76	69	169	130
49	63	101	77	69	171	132
50	63	102	78	69	172	134
51	63	104	79	70	173	136
52	64	105	79	70	175	139
53	64	106	80	71	176	141
54	64	107	81	71	177	143
55	65	109	82	71	178	145
56	65	110	83	72	179	147
57	65	111	84	73	180	150
58	66	112	84	73	181	152
59	66	113	85	74	182	154
60	66	114	86	75	182	156
61	67	115	87	75	183	159
62	67	116	88	76	184	161
63	68	117	89	77	185	163
64	68	118	90	78	185	165
65	68	119	91	79	186	167
66	69	119	92	80	187	169
67	70	121	93	81	187	171
68	70	122	94	82	188	174
69	71	123	95	83	189	176
70	72	124	97	84	189	178
71	72	125	98	85	190	180
72	73	127	99	87	190	181
73	74	128	101	88	191	183
74	74	130	102	89	192	185
75	75	131	103	90	192	187
76	76	133	105	92	193	188
77	76	134	106	93	194	190
78	77	136	108	95	195	191
79	78	137	110	97	196	193
80	79	139	112	99	198	194
81	80	141	114	101	199	195
82	81	142	116	103	200	197
83	81	144	117	104	201	198
84	82	145	119	106	203	200
85	83	147	121	108	204	201

Time (min)	Conduit #6 Surface Minimum Temp (°F)	Conduit #9 Surface Maximum Temp (°F)	Conduit #9 Surface Average Temp (°F)	Conduit #9 Surface Minimum Temp (°F)	Conduit #10 Bare #8 Maximum Temp (°F)	Conduit #10 Bare #8 Average Temp (°F)
86	84	148	123	110	206	202
87	85	150	125	112	207	203
88	86	152	127	115	207	204
89	86	154	129	117	208	205
90	88	155	131	119	209	205
91	88	157	133	121	210	206
92	89	158	135	123	210	207
93	90	160	137	126	211	207
94	91	162	139	128	211	208
95	92	164	141	130	212	208
96	93	165	143	132	212	209
97	94	168	145	134	212	209
98	95	170	147	136	213	209
99	96	172	149	138	213	210
100	97	174	150	140	214	210
101	98	176	152	142	214	210
102	99	178	154	144	215	211
103	100	179	156	146	216	211
104	101	181	158	148	217	211
105	102	183	160	151	218	211
106	103	184	161	152	219	212
107	105	186	162	154	220	212
108	106	187	164	156	222	212
109	107	189	166	158	224	212
110	108	190	168	160	225	213
111	109	191	169	161	227	213
112	110	193	170	163	229	213
113	112	195	172	165	231	214
114	113	195	173	166	233	214
115	113	197	174	168	235	214
116	115	198	176	169	237	215
117	116	199	177	171	240	215
118	117	200	179	172	242	215
119	118	201	180	174	244	216
120	119	202	181	175	246	216
121	121	203	182	177	249	216
122	122	205	185	178	251	217
123	123	203	183	179	253	217
124	124	200	181	176	256	218
125	126	200	182	177	258	218
126	127	199	183	177	261	219
127	128	200	184	179	263	219
128	130	200	185	180	266	220

Time (min)	Conduit #6 Surface Minimum Temp (°F)	Conduit #9 Surface Maximum Temp (°F)	Conduit #9 Surface Average Temp (°F)	Conduit #9 Surface Minimum Temp (°F)	Conduit #10 Bare #8 Maximum Temp (°F)	Conduit #10 Bare #8 Average Temp (°F)
129	131	201	187	182	268	220
130	133	202	188	184	271	221
131	134	202	189	185	274	221
132	136	203	191	187	276	222
133	137	205	192	188	279	222
134	139	207	194	190	282	223
135	140	208	196	192	284	224
136	141	209	197	194	287	224
137	141	210	198	194	290	225
138	143	212	199	195	292	225
139	144	213	200	197	295	226
140	146	215	201	198	298	226
141	147	217	202	199	301	227
142	149	218	204	200	303	227
143	150	219	204	201	306	228
144	152	220	205	202	309	228
145	153	222	206	202	311	229
146	154	223	207	203	314	229
147	155	225	207	203	316	230
148	157	226	208	204	319	230
149	158	228	209	204	321	231
150	159	230	209	204	323	231
151	159	231	210	204	326	230
152	159	233	211	205	328	230
153	160	235	212	205	330	231
154	161	237	213	206	333	232
155	161	239	213	206	336	235
156	161	244	217	209	338	238
157	162	246	218	209	341	239
158	162	247	218	209	344	240
159	164	249	219	209	347	244
160	165	251	220	209	350	248
161	165	253	220	208	353	252
162	166	253	219	206	356	256
163	167	255	220	206	359	259
164	167	257	221	206	362	261
165	168	259	222	206	365	264
166	169	262	224	206	367	267
167	170	264	225	206	370	270
168	171	266	226	207	373	272
169	171	268	227	207	375	275
170	172	270	229	208	378	278
171	173	272	230	209	380	281

Time (min)	Conduit #6 Surface Minimum Temp (°F)	Conduit #9 Surface Maximum Temp (°F)	Conduit #9 Surface Average Temp (°F)	Conduit #9 Surface Minimum Temp (°F)	Conduit #10 Bare #8 Maximum Temp (°F)	Conduit #10 Bare #8 Average Temp (°F)
172	173	275	232	210	383	283
173	175	277	233	211	385	286
174	175	279	235	212	388	289
175	176	281	236	213	391	292
176	177	283	238	215	393	295
177	177	286	239	216	397	297
178	178	288	241	217	398	300
179	179	290	242	218	400	303
180	179	292	244	219	403	306

Time (min)	Conduit #10 Bare #8 Minimum Temp (°F)	Conduit #10 Surface Maximum Temp (°F)	Conduit #10 Surface Average Temp (°F)	Conduit #10 Surface Minimum Temp (°F)	Conduit #11 Surface Maximum Temp (°F)	Conduit #11 Surface Average Temp (°F)
0	65	71	68	67	69	68
1	65	71	68	67	68	68
2	65	68	66	64	66	65
3	65	69	66	64	66	65
4	66	68	66	64	66	65
5	65	68	65	64	65	64
6	65	68	65	64	66	64
7	65	68	65	64	66	64
8	65	68	65	64	66	65
9	65	68	66	64	66	65
10	65	69	66	64	67	65
11	65	69	66	64	88	68
12	65	85	72	68	149	81
13	65	142	96	87	198	113
14	66	168	101	87	206	118
15	66	161	84	64	183	98
16	66	170	89	64	185	101
17	66	174	93	65	186	104
18	66	176	95	65	187	108
19	66	176	97	65	188	111
20	67	175	98	65	188	115
21	67	175	99	65	188	118
22	67	175	100	66	188	122
23	68	175	101	66	187	125
24	68	176	102	66	186	128
25	68	177	104	66	186	131
26	69	179	105	67	185	134
27	69	179	107	67	184	137
28	70	177	108	67	183	140
29	71	174	109	67	181	142
30	71	175	109	68	181	145
31	72	177	109	68	183	148
32	72	177	109	69	185	152
33	73	177	110	69	188	155
34	74	178	110	70	191	159
35	75	178	111	71	194	163
36	76	178	112	71	197	168
37	77	178	113	73	201	173
38	79	178	114	74	203	177
39	80	179	115	75	205	182
40	81	179	116	77	206	186
41	83	180	118	78	206	191
42	85	180	120	79	207	196

Time (min)	Conduit #10 Bare #8 Minimum Temp (°F)	Conduit #10 Surface Maximum Temp (°F)	Conduit #10 Surface Average Temp (°F)	Conduit #10 Surface Minimum Temp (°F)	Conduit #11 Surface Maximum Temp (°F)	Conduit #11 Surface Average Temp (°F)
43	87	180	121	80	206	200
44	88	181	123	81	206	203
45	89	182	125	83	206	204
46	91	183	127	85	207	206
47	92	184	130	86	208	206
48	94	185	132	88	209	207
49	95	186	135	91	209	208
50	97	187	138	93	209	208
51	99	188	140	96	209	208
52	102	188	143	99	209	208
53	104	189	145	102	209	208
54	106	190	148	106	210	208
55	109	190	151	110	210	209
56	112	191	153	112	211	209
57	115	191	156	115	211	209
58	119	191	159	118	212	209
59	122	192	161	121	212	209
60	126	192	163	125	212	209
61	129	192	165	129	213	210
62	133	192	168	134	213	211
63	136	193	170	139	215	212
64	140	193	173	145	218	213
65	144	193	175	151	220	214
66	148	193	177	155	223	216
67	152	194	179	159	226	218
68	157	194	181	162	229	220
69	161	195	184	167	232	222
70	164	196	186	172	235	224
71	168	197	188	177	238	227
72	171	198	190	181	241	230
73	174	199	192	185	244	232
74	177	200	193	187	248	235
75	180	200	195	188	251	238
76	182	201	196	189	254	241
77	184	202	197	190	258	244
78	186	203	199	191	263	248
79	188	204	200	192	267	251
80	189	205	201	194	271	255
81	191	206	202	196	275	258
82	193	207	203	197	279	261
83	194	208	205	200	284	265
84	196	208	206	203	288	268
85	197	209	206	204	292	271

Time (min)	Conduit #10 Bare #8 Minimum Temp (°F)	Conduit #10 Surface Maximum Temp (°F)	Conduit #10 Surface Average Temp (°F)	Conduit #10 Surface Minimum Temp (°F)	Conduit #11 Surface Maximum Temp (°F)	Conduit #11 Surface Average Temp (°F)
86	198	209	207	205	296	275
87	199	210	208	206	301	278
88	201	210	208	206	305	281
89	202	210	208	206	309	285
90	202	210	209	206	313	289
91	203	210	209	207	317	292
92	204	211	209	207	322	296
93	205	211	209	207	326	299
94	206	212	209	207	330	302
95	206	212	209	207	334	306
96	207	213	210	207	338	309
97	207	213	210	207	342	313
98	208	214	210	208	346	316
99	209	214	210	208	350	320
100	209	215	210	208	354	323
101	209	215	210	208	358	327
102	209	216	211	208	362	331
103	210	217	211	208	367	335
104	210	217	211	208	371	338
105	210	218	211	208	375	342
106	209	218	212	208	379	345
107	209	219	212	208	383	349
108	209	220	212	208	387	353
109	209	221	213	209	391	357
110	209	223	214	209	395	360
111	209	225	214	209	399	364
112	209	228	215	210	403	368
113	209	230	216	209	407	371
114	209	233	216	210	411	375
115	209	235	216	209	414	378
116	209	238	217	210	419	382
117	209	240	218	209	422	385
118	209	243	219	210	426	389
119	209	245	219	210	429	392
120	209	248	220	210	434	396
121	210	251	221	210	438	400
122	210	254	221	210	441	403
123	210	257	223	211	445	407
124	210	260	224	211	449	411
125	210	264	225	211	453	414
126	210	266	225	211	457	417
127	210	269	226	211	460	421
128	210	272	226	211	463	424

Time (min)	Conduit #10 Bare #8 Minimum Temp (°F)	Conduit #10 Surface Maximum Temp (°F)	Conduit #10 Surface Average Temp (°F)	Conduit #10 Surface Minimum Temp (°F)	Conduit #11 Surface Maximum Temp (°F)	Conduit #11 Surface Average Temp (°F)
129	210	276	228	212	467	428
130	210	279	229	212	471	431
131	210	282	230	212	474	435
132	211	285	231	212	477	438
133	210	288	232	212	481	441
134	211	291	233	212	603	461
135	212	294	232	212	613	467
136	212	297	230	212	614	472
137	211	298	227	210	615	472
138	211	301	227	210	544	464
139	211	304	228	210	619	472
140	211	307	229	210	613	473
141	211	310	229	210	629	478
142	211	313	230	211	637	497
143	211	316	232	211	644	502
144	211	319	234	211	653	520
145	211	322	236	211	664	527
146	211	325	238	211	664	531
147	211	327	239	211	670	552
148	211	330	242	213	677	572
149	210	333	244	214	690	562
150	209	336	247	217	698	561
151	206	338	249	218	705	573
152	203	341	252	219	710	563
153	203	344	254	221	716	586
154	199	346	257	223	720	601
155	196	349	259	225	710	612
156	196	351	261	226	681	633
157	185	353	264	229	703	637
158	180	356	266	231	722	653
159	185	359	269	233	743	673
160	195	361	271	235	720	680
161	202	364	274	238	726	685
162	207	367	277	241	739	690
163	210	369	280	243	752	701
164	212	372	283	245	756	715
165	214	374	286	248	757	722
166	216	377	289	251	776	735
167	218	380	291	253	778	743
168	220	382	294	256	792	752
169	222	384	297	258	800	766
170	224	387	300	261	818	776
171	226	389	303	264	821	784

Time (min)	Conduit #10 Bare #8 Minimum Temp (°F)	Conduit #10 Surface Maximum Temp (°F)	Conduit #10 Surface Average Temp (°F)	Conduit #10 Surface Minimum Temp (°F)	Conduit #11 Surface Maximum Temp (°F)	Conduit #11 Surface Average Temp (°F)
172	228	391	306	267	817	791
173	230	394	309	270	829	800
174	232	396	311	272	840	810
175	234	398	314	275	851	819
176	237	400	317	278	867	830
177	239	403	320	281	877	835
178	242	405	323	284	886	840
179	244	407	326	287	887	851
180	247	409	328	290	908	865

Time (min)	Conduit #11 Surface Minimum Temp (°F)	Conduit #12 Surface Maximum Temp (°F)	Conduit #12 Surface Average Temp (°F)	Conduit #12 Surface Minimum Temp (°F)	JB #1 Surface Maximum Temp (°F)	JB #1 Surface Average Temp (°F)
0	66	69	69	68	68	66
1	66	69	68	67	68	66
2	63	66	65	64	68	66
3	64	75	68	65	68	66
4	63	100	80	65	68	66
5	63	117	91	66	68	66
6	63	130	102	70	68	66
7	63	150	117	75	68	66
8	63	172	133	82	68	66
9	63	195	156	95	68	66
10	64	203	184	128	68	66
11	64	203	200	188	68	66
12	69	214	209	206	68	66
13	90	235	230	225	68	67
14	90	242	232	225	68	68
15	67	227	211	199	68	70
16	67	239	216	200	68	72
17	68	254	226	202	68	74
18	71	270	236	204	68	76
19	73	284	247	208	68	78
20	75	298	258	216	68	80
21	78	311	269	224	68	82
22	81	325	280	232	68	84
23	84	339	291	241	68	85
24	88	353	302	249	68	87
25	92	367	314	258	69	89
26	96	382	325	268	68	91
27	101	397	337	278	69	93
28	106	414	350	287	69	95
29	111	432	362	297	69	97
30	117	517	405	332	69	99
31	122	469	402	337	69	101
32	127	602	440	356	69	103
33	132	599	459	369	70	104
34	137	641	493	381	71	106
35	143	638	511	393	73	108
36	149	753	569	405	78	109
37	156	790	592	418	83	111
38	163	797	604	431	89	113
39	171	813	622	444	95	114
40	177	763	623	457	101	116
41	183	759	654	470	107	117
42	189	816	676	484	112	119

OMEGA POINT LABORATORIES

Time (min)	Conduit #11 Surface Minimum Temp (°F)	Conduit #12 Surface Maximum Temp (°F)	Conduit #12 Surface Average Temp (°F)	Conduit #12 Surface Minimum Temp (°F)	JB #1 Surface Maximum Temp (°F)	JB #1 Surface Average Temp (°F)
43	195	884	722	581	116	121
44	199	931	754	649	121	123
45	202	946	766	673	125	124
46	204	924	760	676	128	126
47	205	851	751	675	131	128
48	205	841	739	586	133	130
49	206	855	761	578	135	132
50	206	870	768	590	136	134
51	207	900	779	602	136	136
52	207	915	771	623	135	139
53	207	896	773	584	135	141
54	207	903	784	667	134	143
55	207	904	798	686	132	145
56	207	894	791	652	131	147
57	207	905	801	667	128	150
58	208	897	807	658	126	152
59	208	915	816	677	124	154
60	208	915	825	688	122	156
61	208	933	826	677	121	159
62	208	924	840	721	119	161
63	208	955	854	716	118	163
64	209	966	865	747	117	165
65	209	945	872	740	116	167
66	210	942	883	790	115	169
67	211	958	890	808	115	171
68	211	947	896	808	116	174
69	212	962	907	819	116	176
70	213	1000	915	854	117	178
71	214	982	922	865	117	180
72	215	995	942	860	118	181
73	216	1005	961	900	119	183
74	218	1018	985	948	119	185
75	219	1021	974	936	120	187
76	221	1031	985	957	121	188
77	223	1044	1013	964	121	190
78	226	1044	1017	984	122	191
79	228	1048	1020	997	123	193
80	231	1056	1022	995	124	194
81	233	1064	1023	993	124	195
82	236	1072	1038	1013	125	197
83	239	1080	1039	1014	126	198
84	241	1088	1044	1022	127	200
85	244	1097	1042	999	128	201

Time (min)	Conduit #11 Surface Minimum Temp (°F)	Conduit #12 Surface Maximum Temp (°F)	Conduit #12 Surface Average Temp (°F)	Conduit #12 Surface Minimum Temp (°F)	JB #1 Surface Maximum Temp (°F)	JB #1 Surface Average Temp (°F)
86	247	1106	1053	1020	129	202
87	249	1112	1054	1020	130	203
88	252	1118	1060	1032	131	204
89	255	1125	1064	1036	132	205
90	257	1131	1069	1033	133	205
91	260	1139	1074	1035	134	206
92	263	1127	1075	1040	135	207
93	266	1133	1081	1043	136	207
94	269	1138	1078	1045	137	208
95	272	1143	1083	1052	138	208
96	275	1146	1085	1047	139	209
97	277	1149	1090	1046	140	209
98	281	1154	1095	1048	141	209
99	284	1159	1101	1052	142	210
100	287	1165	1108	1057	143	210
101	290	1170	1114	1063	144	210
102	293	1176	1121	1070	146	211
103	296	1182	1128	1078	147	211
104	299	1187	1134	1085	148	211
105	302	1193	1140	1093	149	211
106	305	1198	1147	1101	150	212
107	308	1206	1154	1109	151	212
108	311	1211	1160	1115	152	212
109	314	1216	1166	1122	153	212
110	317	1221	1172	1129	154	213
111	320	1226	1179	1136	155	213
112	323	1231	1185	1142	156	213
113	327	1235	1190	1149	157	214
114	330	1240	1197	1156	158	214
115	332	1245	1202	1162	159	214
116	335	1250	1209	1168	160	215
117	338	1254	1214	1175	161	215
118	342	1259	1221	1181	162	215
119	344	1263	1225	1186	163	216
120	348	1268	1231	1193	165	216
121	351	1273	1237	1200	166	216
122	354	1277	1243	1206	167	217
123	358	1283	1249	1212	168	217
124	361	1288	1255	1218	169	218
125	364	1293	1261	1225	170	218
126	367	1297	1266	1230	171	219
127	370	1302	1271	1236	172	219
128	373	1306	1277	1241	173	220

Time (min)	Conduit #11 Surface Minimum Temp (°F)	Conduit #12 Surface Maximum Temp (°F)	Conduit #12 Surface Average Temp (°F)	Conduit #12 Surface Minimum Temp (°F)	JB #1 Surface Maximum Temp (°F)	JB #1 Surface Average Temp (°F)
129	377	1312	1283	1247	174	220
130	380	1316	1288	1253	175	221
131	383	1320	1292	1258	177	221
132	386	1324	1297	1263	178	222
133	389	1329	1302	1269	179	222
134	392	1333	1307	1274	180	223
135	395	1337	1312	1279	181	224
136	397	1342	1317	1284	182	224
137	397	1345	1321	1288	183	225
138	400	1349	1325	1283	184	225
139	403	1354	1325	1236	185	226
140	406	1359	1318	1129	185	226
141	409	1364	1313	1037	186	227
142	411	1370	1313	987	187	227
143	414	1376	1313	945	188	228
144	417	1382	1317	935	189	228
145	419	1389	1323	933	190	229
146	422	1394	1327	933	191	229
147	444	1400	1332	936	192	230
148	469	1405	1337	939	193	230
149	448	1410	1343	941	194	231
150	451	1415	1348	946	195	231
151	453	1421	1355	959	196	230
152	437	1426	1370	1048	197	230
153	440	1432	1320	655	199	231
154	440	1437	1334	642	200	232
155	465	1443	1324	647	201	235
156	533	1448	1296	657	202	238
157	541	1454	1299	666	203	239
158	581	1459	1311	678	205	240
159	633	1464	1202	690	206	244
160	657	1469	1161	702	208	248
161	666	1470	1128	710	210	252
162	650	1476	1093	662	211	256
163	670	1482	1072	651	213	259
164	697	1476	959	647	215	261
165	687	1482	951	656	216	264
166	717	1306	931	668	218	267
167	719	1287	922	679	220	270
168	728	1255	904	690	221	272
169	740	1245	905	700	223	275
170	741	1257	892	708	225	278
171	749	1257	867	707	227	281

Time (min)	Conduit #11 Surface Minimum Temp (°F)	Conduit #12 Surface Maximum Temp (°F)	Conduit #12 Surface Average Temp (°F)	Conduit #12 Surface Minimum Temp (°F)	JB #1 Surface Maximum Temp (°F)	JB #1 Surface Average Temp (°F)
172	764	1262	872	699	229	283
173	774	1272	885	693	230	286
174	781	1283	896	729	232	289
175	786	1279	898	730	234	292
176	795	1284	902	732	236	295
177	782	1301	914	727	238	297
178	796	1305	918	738	240	300
179	811	1332	892	754	242	303
180	820	1302	887	768	243	306

Time (min)	JB #1 Surface Minimum Temp (°F)	JB#2 Surface Maximum Temp (°F)	JB #2 Surface Average Temp (°F)	JB #2 Surface Minimum Temp (°F)	JB #3 Surface Maximum Temp (°F)	JB #3 Surface Average Temp (°F)	JB #3 Surface Minimum Temp (°F)
0	65	63	63	62	66	66	66
1	65	63	63	62	66	66	66
2	65	62	61	61	66	66	66
3	65	60	60	60	66	66	66
4	66	61	60	60	66	66	66
5	65	62	61	61	66	66	66
6	65	62	62	61	66	66	66
7	65	62	62	61	66	66	66
8	65	62	61	61	66	66	66
9	65	61	61	61	66	66	66
10	65	61	61	61	66	66	66
11	65	61	61	60	67	66	66
12	65	61	61	60	67	66	66
13	65	61	61	61	68	66	66
14	66	61	61	61	69	67	66
15	66	60	60	59	70	67	66
16	66	60	60	59	72	67	66
17	66	59	59	59	74	67	66
18	66	59	58	58	76	67	66
19	66	58	57	57	77	68	66
20	67	57	57	56	79	68	66
21	67	56	56	56	81	68	66
22	67	55	55	54	83	69	66
23	68	54	54	54	84	69	66
24	68	54	53	53	86	69	66
25	68	53	53	53	87	70	66
26	69	53	53	53	88	70	66
27	69	53	53	52	90	70	67
28	70	56	55	55	91	71	67
29	71	59	58	58	92	71	67
30	71	53	53	53	93	71	67
31	72	54	53	53	95	72	67
32	72	59	58	58	96	72	67
33	73	60	59	59	98	73	67
34	74	60	60	59	99	73	67
35	75	61	60	60	100	73	68
36	76	61	61	60	101	74	68
37	77	61	61	60	102	74	68
38	79	62	61	60	103	75	68
39	80	65	64	62	104	76	68
40	81	66	65	64	104	76	69
41	83	67	66	64	105	77	69
42	85	69	68	66	106	77	69

OMEGA POINT LABORATORIES

Time (min)	JB #1 Surface Minimum Temp (°F)	JB#2 Surface Maximum Temp (°F)	JB #2 Surface Average Temp (°F)	JB #2 Surface Minimum Temp (°F)	JB #3 Surface Maximum Temp (°F)	JB #3 Surface Average Temp (°F)	JB #3 Surface Minimum Temp (°F)
43	87	68	67	65	106	78	69
44	88	68	67	66	107	79	70
45	89	68	68	67	108	79	70
46	91	72	70	69	109	80	70
47	92	77	72	70	110	81	71
48	94	82	76	73	111	82	71
49	95	89	81	76	112	83	72
50	97	96	87	79	113	83	72
51	99	105	94	84	114	84	73
52	102	114	101	90	115	85	74
53	104	124	109	97	117	86	74
54	106	134	118	105	118	87	75
55	109	144	127	113	119	87	76
56	112	155	136	121	120	88	77
57	115	166	146	131	121	89	77
58	119	183	159	142	122	90	78
59	122	196	171	154	123	91	79
60	126	217	186	171	125	92	79
61	129	241	200	184	126	93	80
62	133	266	211	194	128	94	81
63	136	290	223	203	129	95	81
64	140	313	235	212	130	96	82
65	144	334	247	221	132	97	83
66	148	353	260	231	133	98	84
67	152	370	271	240	134	99	84
68	157	387	283	251	135	100	85
69	161	407	297	262	137	101	86
70	164	440	313	273	138	102	87
71	168	477	329	285	139	103	87
72	171	513	346	296	140	104	88
73	174	551	365	308	142	105	89
74	177	752	433	340	143	106	90
75	180	1148	555	390	144	107	91
76	182	1135	651	464	145	109	92
77	184	1137	743	560	146	110	93
78	186	1161	809	642	147	111	93
79	188	1129	853	712	148	112	94
80	189	1141	909	771	149	113	95
81	191	1242	1011	845	151	114	96
82	193	1285	1163	1024	153	115	97
83	194	1430	1339	1237	155	116	98
84	196	1494	1443	1394	157	118	99
85	197	1567	1528	1493	158	119	100

Time (min)	JB #1 Surface Minimum Temp (°F)	JB#2 Surface Maximum Temp (°F)	JB #2 Surface Average Temp (°F)	JB #2 Surface Minimum Temp (°F)	JB #3 Surface Maximum Temp (°F)	JB #3 Surface Average Temp (°F)	JB #3 Surface Minimum Temp (°F)
86	198	1565	1558	1540	160	120	101
87	199	1556	1538	1510	163	121	103
88	201	1577	1533	1495	167	123	104
89	202	1606	1578	1527	170	124	105
90	202	1626	1607	1596	171	125	106
91	203	1641	1620	1597	174	127	107
92	204	1652	1624	1580	176	128	108
93	205	1660	1614	1549	178	129	109
94	206	1666	1605	1534	181	131	111
95	206	1649	1556	1487	182	132	112
96	207	1605	1506	1451	184	133	113
97	207	1499	1472	1441	185	135	114
98	208	1474	1450	1441	188	136	116
99	209	1459	1441	1421	190	138	117
100	209	1438	1418	1372	190	139	118
101	209	1410	1376	1337	193	140	120
102	209	1384	1351	1312	196	142	121
103	210	1401	1358	1315	197	143	122
104	210	1409	1369	1325	198	145	124
105	210	1408	1375	1329	200	146	125
106	209	1415	1389	1355	203	148	126
107	209	1429	1405	1379	205	150	127
108	209	1469	1431	1394	206	152	129
109	209	1483	1445	1406	207	153	130
110	209	1513	1465	1417	208	155	131
111	209	1541	1494	1437	208	157	132
112	209	1538	1497	1447	209	158	134
113	209	1565	1519	1462	209	160	135
114	209	1594	1540	1476	209	162	136
115	209	1611	1554	1482	209	164	138
116	209	1634	1570	1499	209	166	139
117	209	1650	1582	1509	209	167	141
118	209	1655	1594	1512	210	169	142
119	209	1671	1602	1523	209	171	143
120	209	1679	1608	1527	210	172	145
121	210	1687	1614	1530	210	174	146
122	210	1700	1620	1534	210	175	148
123	210	1715	1615	1527	210	177	149
124	210	1715	1609	1523	210	178	151
125	210	1722	1611	1525	210	180	152
126	210	1725	1614	1525	211	181	154
127	210	1731	1615	1527	211	182	155
128	210	1733	1616	1526	211	184	157

Time (min)	JB #1 Surface Minimum Temp (°F)	JB#2 Surface Maximum Temp (°F)	JB #2 Surface Average Temp (°F)	JB #2 Surface Minimum Temp (°F)	JB #3 Surface Maximum Temp (°F)	JB #3 Surface Average Temp (°F)	JB #3 Surface Minimum Temp (°F)
129	210	1724	1615	1526	211	185	159
130	210	1736	1621	1532	212	186	160
131	210	1747	1624	1536	212	187	162
132	211	1753	1629	1553	213	188	163
133	210	1763	1626	1545	213	189	165
134	211	1762	1629	1549	214	190	166
135	212	1772	1633	1554	214	191	168
136	212	1776	1635	1554	215	192	169
137	211	1775	1635	1553	215	193	171
138	211	1779	1639	1557	216	194	172
139	211	1782	1642	1557	217	195	174
140	211	1785	1647	1563	217	196	175
141	211	1793	1661	1589	218	197	176
142	211	1793	1655	1572	218	198	178
143	211	1797	1657	1571	219	199	179
144	211	1799	1658	1568	219	200	180
145	211	1801	1659	1569	220	201	182
146	211	1803	1660	1571	221	202	183
147	211	1800	1658	1570	221	203	184
148	211	1802	1658	1574	222	203	185
149	210	1799	1658	1577	222	204	186
150	209	1799	1660	1577	223	205	188
151	206	1805	1667	1592	224	206	189
152	203	1804	1662	1581	224	207	190
153	203	1802	1666	1581	225	208	191
154	199	1804	1672	1584	226	208	193
155	196	1807	1673	1584	227	209	194
156	196	1807	1678	1591	227	210	195
157	185	1809	1681	1595	228	211	197
158	180	1813	1683	1599	229	212	198
159	185	1811	1684	1600	230	213	200
160	195	1812	1682	1603	230	213	201
161	202	1812	1680	1602	231	214	203
162	207	1809	1677	1600	232	215	204
163	210	1807	1677	1601	233	216	205
164	212	1807	1677	1600	234	217	206
165	214	1808	1677	1601	235	218	207
166	216	1812	1681	1601	236	218	207
167	218	1809	1678	1595	236	219	208
168	220	1808	1675	1590	237	220	208
169	222	1808	1673	1575	238	221	209
170	224	1802	1675	1583	239	222	209
171	226	1807	1673	1576	241	223	209

Time (min)	JB #1 Surface Minimum Temp (°F)	JB#2 Surface Maximum Temp (°F)	JB #2 Surface Average Temp (°F)	JB #2 Surface Minimum Temp (°F)	JB #3 Surface Maximum Temp (°F)	JB #3 Surface Average Temp (°F)	JB #3 Surface Minimum Temp (°F)
172	228	1809	1676	1597	242	224	210
173	230	1804	1672	1576	243	225	210
174	232	1797	1673	1582	244	226	210
175	234	1795	1670	1579	246	227	210
176	237	1793	1671	1573	247	228	210
177	239	1790	1673	1587	249	229	210
178	242	1792	1670	1585	250	230	210
179	244	1798	1668	1574	251	232	211
180	247	1798	1668	1576	253	233	211

Time (min)	Trapeze Hanger Maximum Temp (°F)	Trapeze Hanger Average Temp (°F)	Trapeze Hanger Minimum Temp (°F)
0	70	69	69
1	70	69	69
2	67	66	66
3	67	67	66
4	67	66	66
5	66	66	65
6	66	66	65
7	67	66	65
8	67	66	65
9	67	66	66
10	67	67	66
11	68	67	67
12	79	78	77
13	122	99	93
14	165	105	94
15	165	83	71
16	178	86	72
17	183	88	73
18	187	91	75
19	191	95	77
20	193	100	79
21	195	106	82
22	197	111	84
23	198	115	87
24	198	119	90
25	198	123	94
26	199	127	97
27	199	131	101
28	199	134	105
29	199	138	109
30	200	143	114
31	201	151	118
32	204	156	122
33	208	159	127
34	208	163	132
35	208	173	137
36	208	176	142
37	209	179	146
38	209	181	149
39	209	184	153
40	209	186	157
41	209	188	160
42	209	191	164

OMEGA POINT LABORATORIES

Time (min)	Trapeze Hanger Maximum Temp (°F)	Trapeze Hanger Average Temp (°F)	Trapeze Hanger Minimum Temp (°F)
43	209	194	168
44	209	197	173
45	209	200	179
46	209	202	184
47	209	204	190
48	209	206	195
49	213	209	201
50	219	212	207
51	226	214	209
52	231	217	209
53	236	220	209
54	242	224	209
55	248	229	209
56	253	235	209
57	259	240	210
58	265	247	214
59	271	253	219
60	277	260	227
61	283	266	235
62	294	274	242
63	295	280	249
64	357	294	256
65	308	294	263
66	385	309	270
67	397	317	276
68	636	364	283
69	657	402	290
70	672	410	297
71	676	417	303
72	703	426	310
73	710	433	316
74	716	438	322
75	729	439	328
76	721	480	334
77	745	535	340
78	759	545	346
79	753	550	351
80	768	556	357
81	780	559	362
82	796	570	367
83	820	578	372
84	818	574	377
85	830	581	381

Time (min)	Trapeze Hanger Maximum Temp (°F)	Trapeze Hanger Average Temp (°F)	Trapeze Hanger Minimum Temp (°F)
86	843	588	386
87	860	599	391
88	873	606	403
89	885	618	415
90	907	631	421
91	914	637	428
92	902	643	432
93	923	652	437
94	933	659	441
95	930	662	445
96	943	664	449
97	963	676	453
98	985	688	458
99	1002	700	462
100	1019	716	466
101	1051	755	471
102	1051	758	475
103	1046	764	480
104	1047	775	484
105	1058	782	489
106	1063	802	493
107	1079	797	498
108	1086	804	502
109	1092	805	507
110	1096	814	512
111	1099	827	516
112	1102	845	520
113	1105	856	524
114	1108	857	528
115	1110	864	531
116	1112	876	534
117	1114	880	537
118	1117	888	540
119	1119	890	542
120	1122	893	545
121	1125	891	548
122	1128	891	550
123	1132	895	552
124	1136	898	555
125	1140	913	561
126	1144	946	571
127	1148	928	598
128	1153	936	636

OMEGA POINT LABORATORIES

Time (min)	Trapeze Hanger Maximum Temp (°F)	Trapeze Hanger Average Temp (°F)	Trapeze Hanger Minimum Temp (°F)
129	1158	945	652
130	1164	952	663
131	1169	959	674
132	1174	966	685
133	1179	986	696
134	1185	1001	711
135	1190	1012	717
136	1194	1019	732
137	1198	1023	745
138	1203	1024	763
139	1208	1022	780
140	1214	1032	798
141	1219	1034	816
142	1224	1042	834
143	1229	1044	854
144	1233	1062	878
145	1236	1075	917
146	1239	1075	961
147	1144	1027	672
148	1137	983	677
149	1139	928	649
150	1144	943	659
151	1150	978	670
152	1155	957	686
153	1160	949	691
154	1201	961	699
155	1222	906	620
156	1172	825	624
157	1231	813	628
158	1188	805	634
159	1198	817	636
160	1209	775	646
161	1223	786	653
162	1240	799	665
163	1259	808	678
164	1286	820	690
165	1307	864	698
166	1317	832	708
167	1328	843	719
168	1339	852	731
169	1361	860	740
170	1364	866	748
171	1365	865	699

Time (min)	Trapeze Hanger Maximum Temp (°F)	Trapeze Hanger Average Temp (°F)	Trapeze Hanger Minimum Temp (°F)
172	1367	874	697
173	1369	888	728
174	1370	897	733
175	1372	905	733
176	1375	901	744
177	1378	911	746
178	1381	920	732
179	1384	933	730
180	1387	946	740