sta #4 (15)
AUG 2 1999

ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT 626324

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) SNF Project W-441	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: SNF Project W-441	6. Design Authority/ Design Agent/Cog. Engr.: C. Van Katwijk	7. Purchase Order No.: N/A
8. Originator Remarks: N/A		9. Equip./Component No.: N/A
		10. System/Bldg./Facility: SNF CVDF
11. Receiver Remarks: N/A		12. Major Assm. Dwg. No.: N/A
11A. Design Baseline Document? ☐ Yes ☒ No		13. Permit/Permit Application No.: N/A
		14. Required Response Date: N/A

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Design- nator	Reason for Trans- mittal	Origi- nator Dispo- sition	Receiv- er Dispo- sition
1	SNF-4914		0	CONDUIT FOR SAFETY CLASS WIRING	SQ	2	1	N/A

16. KEY					
Approval Designator (F)		Reason for Transmittal (G)		Disposition (H) & (I)	
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)		1. Approval	4. Review	1. Approved	4. Reviewed no/comment
		2. Release	5. Post-Review	2. Approved w/comment	5. Reviewed w/comment
		3. Information	6. Dist. (Receipt Acknow. Required)	3. Disapproved w/comment	6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)									
(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature (L) Date (M) MSIN
2	1	Designated Engineer	C. Van Katwijk	7/29/99				See Distribution	
2	1	Design Authority	D. Whitehurst	7/29/99					
2	1	Safety	J. Brehm	7/29/99					
2	1	for. Ramsgate		7/29/99					

18. T. Nuxall Signature of EDT Originator Date 7/29/99	19. T. Choho Authorized Representative for Receiving Organization Date 7/28/99	20. D. Whitehurst Design Authority/ Cognizant Manager Date 7/30/99	21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments
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CONDUIT FOR SAFETY CLASS WIRING

Carl Van Katwijk
Numatec Hanford, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 626324	UC: 620
Org Code: 2G300	Charge Code: 105559/A000
B&R Code: 39EW40400	Total Pages: 34

Key Words: Conduit for Safety Class Wiring

Abstract: Conduit for Safety Class Wiring

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Release Approval

Genis Braden

8/2/99

Date

Release Stamp

Approved for Public Release

Commercial Grade Item Upgrade Dedication Form		SNF-4914, Rev. 0
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Title: CONDUIT FOR SAFETY CLASS WIRING		

Section 1 Part Information		
Item No.: NA	Manufacturer:	Supplier:
Mfg. Part/Model No.:	Supplier's P/N:	
Part Description:		
End Use Description:		

Section 2a Component Information			
Equipment No.: See attached Section 9	Specification No.: W-441-C1, Section 16110	Manufacturer: American Electric	Past P.O. No.: NA
Procurement and/or Model No.: See attached Section 9	Equipment Supplier (if different from manufacturer): NA		Equip. Supplier's Part No.: NA
Component Description: Rigid conduit, nipples, sealtight flex connectors, struts and straps, condulets, locknuts/grounding locknuts, washers, spring nuts, flexible metal conduit/connectors.			

Section 2b Commercial Availability of the Item														
<p>1. Is the Item available from a catalogue of a qualified NQA1 supplier? (coordinate with project CGI interface Engineer or BTR)</p> <p>☐ YES (go to #2 below)</p> <p>☒ NO (go to procedure step 6.3.2, proceed to dedicate Item.)</p> <p>If not available from a qualified NQA1 supplier, is it available from an ISO 9000 supplier? (coordinate with project CGI interface Engineer or BTR)</p> <p>☐ YES (go to #2 below, then go to procedure step 6.3.2, proceed to dedicate Item)</p> <p>☒ NO (go to procedure step 6.3.2, proceed to dedicate Item.)</p>														
<p>2. List of Candidate qualified suppliers or ISO 9000 suppliers</p> <table border="1"> <thead> <tr> <th>company name & type</th> <th>contact name</th> <th>phone</th> </tr> </thead> <tbody> <tr> <td colspan="3">NA</td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td colspan="3"> </td> </tr> </tbody> </table>			company name & type	contact name	phone	NA								
company name & type	contact name	phone												
NA														
<p>3. Recommended Procurement Strategy (coordinate with project CGI interface Engineer or BTR):</p> <p>NA</p>														

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Section 2c CGI Determination	
1. Question #1: Is the Item subject to design or specification requirements that are unique to nuclear facilities or activities?	
☐ YES (the Item is not commercial grade)	
☒ NO (continue)	
2. Question #2: Is the Item used in applications other than nuclear facilities or activities?	
☐ NO (the item is not commercial grade)	
☒ YES (continue)	
3. Question #3: Is the Item ordered from manufacturer/supplier on the basis or specifications set forth in the published product information (e.g. manufacturer's catalog)?	
☐ NO (the Item is not commercial grade)	
☒ YES (continue)	
☒ All three criteria have been satisfied. The Item meets the definition of commercial grade.	
Section 2d Reason for Dedication	
The above described Item is being Dedicated for use in the application cited for the following reason(s):	
☒	Item is being purchased from a non ESL manufacturer supplier as commercial grade to be used in a Safety Class application.
☐	Item is being purchased from a non ESL manufacturer supplier as commercial grade to be used in a Safety Significant application.
☐	Item was purchased from a non ESL manufacturer supplier as commercial grade to be used in a Safety Class application.
☐	Item was purchased from a non ESL manufacturer supplier as commercial grade to be used in a Safety Significant application.
☐	Other ('like-for-like', similar, substitution, replacement evaluation)
Section 3 Failure Effects Evaluation	
A. Part/Component Safety Function:	
1. Provide conduit protection, structural support for safety class wiring.	
2. Maintain critical function before, during, and after Seismic Event.	
3.	
B. Part/Component Functional Mode:	
Safety Function #1:	
☐	Active – Mechanical or Electrical change of state is required to occur for the component to perform its safety function
☒	Passive – Change of state is not required for the component to perform its safety function
Safety Function #2:	
☐	Active – Mechanical or Electrical change of state is required to occur for the component to perform its safety function.
☒	Passive – Change of state is not required for the component to perform its safety function
Safety Function #3:	
☐	Active – Mechanical or Electrical change of state is required to occur for the component to perform its safety function.
☐	Passive – Change of state is not required for the component to perform its safety function

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C. Host Component Safety Function (if applicable): NA		
1.		
D. Failure Mode(s) and the effects on component or system safety function (see Worksheet 1):		
1. Fracture or material fatigue leads to loss of structural support and possible damage to wiring.		
2. Loss of sealtight integrity of fittings could result in moisture corrosion and possible damage to wiring.		
3.		
4.		
5.		
Section 4 Environmental & Natural Phenomena Hazard Design		
Environmental Qualification Required:	If yes: Environmental Qualification Requirements	
Yes []	Limiting Environmental Conditions:	
No [X]	Required Safety Functions:	
Environmental Condition B	Qualification Period:	
Natural Phenomena Hazard (NPH) Design Required:	If yes: NPH Design Requirements	
Yes [X]	Performance Category: PC-3	
No []	NPH Design Req'ts.: Seismic Condition C	
HNF-PRO-97, Rev. 0	Required Safety Functions: Provide protection and support for safety class wiring. Maintain critical function before, during, and after Seismic Event.	
Section 5 Component Functional Classification		
[X] Safety Class (SC)	[] General Service (GS)	[] Safety Significant (SS)
If part/component classification is different from host component/system, document basis. NA		
Section 6 (Reserved)		
Section 7 (Reserved)		
Section 8 References (for Functional Classification)		
National Codes/Standards: IEEE 628	Safety Analysis Report (SAR): HNF-SD-SNF-SAR-002, Rev. 4A	Drawings: HNF-SD-SNF-SEL-002, Rev. 6A
Vendor Manual/Manufacturer/Supplier Information: Rigid Conduit - LTV Steel Tubular Products/Galvite Rigid Conduit Nipples/Connectors /Locknuts/Beam Clamps/Reducers- Appleton Catalog CF-2 Pages 4, 5, 6, 7, 10;		
Covers and gaskets for Form 35 Conduit Outlet Boxes - Appleton Catalog A-8, Pages 6 and 7		
Conduit Nipples - Conduit Pipe Products Catalog Page KG		
Flexible Steel Conduit - Thomas & Betts Liquidtight Flexible Metal Conduit and Fittings/Connectors, Pages 8 and 23.		
Metal Framing Channels/Pipe Straps - Superstrut Series 1000 Section 1, Pages 6, 7, 39;		
Fender Washers - ABC Fasteners Page 2-1;		
PS-146 Continuous Threaded Rod/Clamping Nut with spring - Power Strut Pages 40, 42		

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Title: **CONDUIT FOR SAFETY CLASS WIRING**

Other:

Section 9. Critical Characteristics

Critical Characteristics Verification Document	Acceptance Criteria/Tolerances	Acceptance Method	ID	Function
American Electric Purchase Orders C188R12TM3157 6/16/99; C188R12TM3158, 6/16/99 and C188R12TM3168, 6/17/99 HNF-SD-SNF-SEL-002, Rev. 6A				
1. Item Identification Critical Characteristics (necessary for reasonable assurance that the Item delivered is the Item specified)				
Manufacturer, All Rigid Conduit 1/2" Rigid Conduit 3/4" Rigid Conduit 1" Rigid Conduit 1 1/4" Rigid Conduit 1 1/2" Rigid Conduit	LTV Steel Tubular Products/Galvite Verify UL marking on the conduit sample lot. Verify Size marking on the conduit sample lot or verify identifying dimensions on the conduit sample lot as follows: Nominal 0.622" ID Nominal 0.824" ID Nominal 1.049" ID Nominal 1.380" ID Nominal 1.610" ID	1, IN	X	
Threaded Rigid Conduit Nipples, Page KG Manufacturer, All Rigid Conduit Nipples 1/2" 3/4" 1" 1 1/2"	Conduit Pipe Products Verify UL marking on the sample lot. Verify Size marking on the sample lot or verify identifying dimensions on the sample lot as follows: Nominal 1/2" Nominal 3/4" Nominal 1" Nominal 1 1/2"	1, IN	X	

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<p>Threaded Rigid Conduit Bushed Nipples, Page 6 Manufacturer, All Rigid Conduit Bushed Nipples</p> <p>CN-50</p> <p>CN-75</p> <p>CN-100</p> <p>CN-125</p> <p>CN-150</p>	<p>Appleton Electric Company</p> <p>Verify UL marking on the sample lot. Verify part identifying marking on the sample lot or verify identifying Dimensions on the sample lot as follows:</p> <p>Nominal 1/2" -"A" Dimension, Nominal 7/16"</p> <p>Nominal 3/4" -"A" Dimension, Nominal 1/2"</p> <p>Nominal 1" -"A" Dimension, Nominal 5/8"</p> <p>Nominal 1 1/4" -"A" Dimension, Nominal 11/16"</p> <p>Nominal 1 1/2" -"A" Dimension, Nominal 7/8"</p>	<p>1, IN</p>	<p>X</p>	
<p>Threaded Rigid Conduit, Connectors, Page 5 Manufacturer, All Threaded Rigid Conduit 3 Piece Connectors</p> <p>EC-50</p> <p>EC-75</p> <p>EC-100</p> <p>EC-125</p> <p>EC-150</p>	<p>Appleton Electric Company</p> <p>Verify UL marking on the sample lot. Verify identifying marking on the sample lot or identifying dimensions on the sample lot as follows:</p> <p>Nominal 1/2" -"A" Dimension, Nominal 1 7/16"</p> <p>Nominal 3/4" -"A" Dimension, Nominal 1 9/16"</p> <p>Nominal 1" -"A" Dimension, Nominal 1 11/16"</p> <p>Nominal 1 1/4" -"A" Dimension, Nominal 2 1/8"</p> <p>Nominal 1 1/2" -"A" Dimension, Nominal 2 3/16"</p>	<p>1, IN</p>	<p>X</p>	

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Title: **CONDUIT FOR SAFETY CLASS WIRING**

Threaded Rigid Conduit, Reducers, Page 7 Manufacturer, All Threaded Rigid Conduit Reducers RB75-50 RB100-50 RB150-50 RB100-75 RB150-75 RB125-100 RB150-100	Appleton Electric Company Verify UL marking on the sample lot. Verify identifying marking on the parts in the sample lot or verify identifying dimension on the sample lot as follows: 3/4" - 1/2" 1" - 1/2" 1 1/2" - 1/2" 1" - 3/4" 1 1/2" - 3/4" 1 1/4" - 1" 1 1/2" - 1"	1, IN	X	
Rigid Conduit Condulet, Form 35, Page 6 Manufacturer, All Rigid Conduit Condulet Form 35 LB/T/LR/LL-1/2" LB/T/LR/LL-3/4" LB/T/LR/LL-1" LB/T/LR/LL-1 1/2"	Appleton Electric Company Verify UL marking on the sample lot. Verify Size marking on the condulet sample lot or verify identifying dimension on the condulet sample lot as follows: Nominal 1/2" Nominal 3/4" Nominal 1" Nominal 1 1/2"	1, IN	X	
Rigid Conduit Locknuts, Page 10 Manufacturer, All Rigid Conduit Locknuts / Grounding Locknuts BL-50 / GL-50 BL-75 / GL-75 BL-100 / GL-100 BL-125 / GL-125 BL-150 / GL-150	Appleton Electric Company Verify UL marking on the sample lot. Verify Size marking on the locknut sample lot or verify identifying dimension on the locknut sample lot as follows: Nominal 1/2" Nominal 3/4" Nominal 1" Nominal 1 1/4" Nominal 1 1/2"	1, IN	X	

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Rigid Metal Conduit Beam Clamps, Page 4 Manufacturer, All Rigid Metal Conduit Beam Clamps BH-502 BH-503	Appleton Electric Company Verify identifying marking on the sample lot or verify identifying dimensions on the sample lot as follows: 2" Size, Jaw Opening Nominal 15/16" 2 1/2" Size, Jaw Opening Nominal 1 1/16"	1, IN	X	
Liquidtight Flexible Steel Conduit, Page 8 Manufacturer, All Flexible Conduit Type LA-11 Type LA-12 Type LA-13 Type LA-14 Type LA-15	Thomas & Betts Verify UL marking on the conduit sample lot. Verify Size marking on the conduit sample lot or verify identifying dimensions on the conduit sample lot as follows: Nominal 1/2" Diameter Nominal 3/4" Diameter Nominal 1" Diameter Nominal 1 1/4" Diameter Nominal 1 1/2" Diameter	1, IN	X	
Liquidtight Flexible Metal Conduit Fittings, Page 23 Manufacturer, Flexible Conduit Connectors 5332 5333 5334 5335 5336	Thomas and Betts Verify UL marking on the sample lot. Verify identifying marking on the sample lot or verify identifying dimensions on the sample lot as follows: Nominal 1/2" -"A" Dimension, Nominal 1 3/8" Nominal 3/4" -"A" Dimension, Nominal 1 21/32" Nominal 1" -"A" Dimension, Nominal 1 7/8" Nominal 1 1/4" -"A" Dimension, Nominal 2 9/32" Nominal 1 1/2" -"A" Dimension, Nominal 2 23/32"	1, IN	X	

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Metal Framing Channels/Pipe Straps, Pages 7 and 39 Manufacturer, All Framing Channels/Pipe Straps Half Slot Channel A-1200-HS 702 Pipe Straps 702-1/2 702-3/4 702-1 702-1 1/4 702-1 1/2	Superstrut Nominal 1 5/8" x 1 5/8", 12 gage. Verify identifying marking on the sample lot or verify identifying dimensions on the sample lot as follows: Pipe OD Nominal 0.840", 14 gage Pipe OD Nominal 1.050", 14 gage Pipe OD Nominal 1.315", 14 gage Pipe OD Nominal 1.660", 14 gage Pipe OD Nominal 1.900", 14 gage	1, IN	X
Fender Washer, Page 2-1, Manufacturer 20004 20008 20015	ABC Fasteners 1/4" x 1 1/4" 3/8" x 1 1/2" 1/2" x 2"	1, IN	X
Fasteners, Pages 40 and 42 Manufacturer PS 146 Continuous Threaded Rod PS RS Clamping Nut with Regular Spring. PS RS	Powerstrut Nominal 3/8" Nominal 1/2" Nominal 5/8" Nominal 3/4" 1/4" x 20 3/8" x 16 1/2" x 13 5/8" x 11 3/4" x 10 7/8" x 9	1, IN	X

2. Physical Critical Characteristics (for reasonable assurance that the Item delivered is the Item specified)

All Size Rigid Conduit, Material	Steel (Note 3)	1, IN 1, T	X
All Size Rigid Conduit Nipples, Material	Steel (Note 3)	1, IN 1, T	X
All Size Threaded Rigid Conduit Bushed Nipples, Material	Steel (Note 3)	1, IN 1, T	X

07/28/99

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Threaded Rigid Conduit, Three Piece Connectors, Material	Steel (Note 3)	1, IN 1, T	X	
Threaded Rigid Conduit, Reducers, Material	Steel (Note 3)	1, IN 1, T	X	
Rigid Conduit Condulet Form 35, Material	Steel (Note 3)	1, IN 1, T	X	
Rigid Conduit, Locknuts/Grounding Locknuts, Material	Steel (Note 3)	1, IN 1, T	X	
Rigid Metal Conduit, Beam Clamps, Material	Steel (Note 3)	1, IN 1, T	X	
All Size Liquidtight Flexible Steel Conduit, Jacketing Material	Flexible PVC Compound (Note 3)	1, IN 1, T	X	
Flexible Steel Conduit, Connectors, Material	Steel (Note 3)	1, IN 1, T	X	
Framing Channel, Material	Steel (Note 3)	1, IN 1, T	X	
Framing Channel 702 Pipe Straps, Material	Steel (Note 3)	1, IN 1, T	X	
Fender Washer, Material	Zinc Coated Steel (Note 3)	1, IN 1, T	X	
Fasteners, PS 146 Continuous Threaded Rod.	Steel (Note 3)	1, IN 1, T	X	
PS RS Clamping Nut with Regular Spring.	Steel (Note 3)			
3. Performance Critical Characteristics (for reasonable assurance that the Item will perform its intended safety function(s))				
Environmental	Note 1			
Seismic Condition C	Note 2	1, T 1, A		X

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4. Notes and Legend:

1. The components are not subject to degradation from the 40°F or 60% RH or 115°F and 22% RH conditions and are suitable for Environmental Condition B application.
2. Maintain critical function before, during, and after Seismic event. Equipment that has been shaker-table tested should not be installed in a plant (Ref. IEEE Standard 344-1984, Section 7). Consequently, the seismic test constitutes a destructive test. Seismic Design may be verified by analysis of the installed conduit system.
3. Material verification acceptance method may be by either inspection or test.

Acceptance Method:

1. Special Test and Inspection
 - 1, IN for Inspection
 - 1, T for Test
 - 1, A for Acceptance by Analysis
2. Commercial Grade Survey
3. Source Verification
4. Vendor/Item History

Section 10 Initial Review and Approval

Approvals:

Designated Engineer:

W. B. M. Padu

Design Authority:

M. W. J. Haller 7/20/99

QA Engineer:

A. Mischke 7/27/99

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WORKSHEET 1 DETERMINATION OF FAILURE MECHANISMS/MODES

Section 1

Typical Failure Mechanisms	Definition	Applicable to Component under Evaluation
Fracture	Separation of a solid accompanied by little or no macroscopic plastic deformation.	Yes [☒] No [☐]; If Yes, indicate failure Mode: <u>Fracture or material fatigue-loss of structural protection to wiring</u>
Corrosion	The gradual deterioration of a material due to chemical or electrochemical reactions, such as oxidation, between the material and its environment.	Yes [☐] No [☒]; If Yes, indicate failure Mode: _____
Erosion	Destruction of materials by the abrasive action of moving fluids, usually accelerated by the presence of solid particles carried with the fluid.	Yes [☐] No [☒]; If Yes, indicate failure Mode: _____
Open Circuit	An electrical circuit that is unintentionally broken so that there is no complete path for current flow.	Yes [☐] No [☒]; If Yes, indicate failure Mode: _____
Short Circuit	An abnormal connection by which an electrical current is connected to ground, or to some conducting body, resulting in excessive current flow.	Yes [☐] No [☒]; If Yes, indicate failure Mode: _____
Blockage	Clogging of a filtering medium resulting in the inability to perform its purification function or blockage of flow.	Yes [☐] No [☒]; If Yes, indicate failure Mode: _____
Seizure	Binding of a normally moving item through excessive pressure, temperature, friction, jamming.	Yes [☐] No [☒]; If Yes, indicate failure Mode: _____
Unacceptable Vibration	Mechanical oscillations produced are beyond the defined permissible limits due to unbalancing, poor support, or rotation at critical speeds.	Yes [☐] No [☒]; If Yes, indicate failure Mode: _____
Loss of Properties	A loss of mechanical and physical properties of a material due to exposure to high temperatures, radiation exposure.	Yes [☐] No [☒]; If Yes, indicate failure Mode: _____
Excess Strain	Under the action of excessive external forces the material of the part has been deformed or distorted.	Yes [☒] No [☐]; If Yes, indicate failure Mode: <u>Material fatigue leads to loss of structural support and enclosure of wiring</u>
Mechanical Creep	From prolonged exposure to high temperature and stress, the object will show a slow change in its physical (shape and dimension) and mechanical characteristics.	Yes [☐] No [☒]; If Yes, indicate failure Mode: _____
Ductile Fracture	Fracture characterized by tearing of metal accompanied by appreciable gross plastic deformation.	Yes [☒] No [☐]; If Yes, indicate failure Mode: <u>Fracture or material fatigue - loss of structural support and protection of wiring</u>

Section 2: Additional Failure Modes Applicable to the Component Under Evaluation

- 1.
- 2.
- 3.
- 4.
- 5.

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Title: **CONDUIT FOR SAFETY CLASS WIRING**

CHECKLIST 1

ACCEPTANCE METHOD 1

SPECIAL TEST/INSPECTION VERIFICATION

SECTION 1

Item Description: Rigid conduit, nipples, sealtight flex connectors, condulets, struts and straps, fender washers, locknuts, grounding locknuts, spring nuts, flexible metal conduit/connectors.

Equip #: **NA**

Procurement and/or Model #: See Catalog Numbers in Section 8 and Characteristics in Section 9.

System #: **93-2**

Manufacturer (Address/Phone):

Supplier (Address/Phone):

Various - See Sections 8 and 9.

P.O. #

SECTION 2: CRITICAL CHARACTERISTICS TO BE VERIFIED BY METHOD 1.

Insp	Test	Post-Test	
☒	☐	☐	1. Description and characteristics for identification. (See 12 items listed below under inspection.
☒	☒	☐	2. Material verification for identification. (See 12 items below under inspection)
☐	☒	☐	3. Seismic Condition C (Seismic verification may be by test or by analysis)
☐	☐	☐	4.
☐	☐	☐	5.
☐	☐	☐	6.
☐	☐	☐	7.
☐	☐	☐	8.

SECTION 3 VERIFIED BY INSPECTION

* See Attachment H of Desk Instruction for Sampling Size: Reduced Sampling Plan Was Selected Due to The Product History and Simplicity of Product

Characteristic: **Manufacturer, All Rigid Conduit**

Sample Size*: **REDUCED SAMPLING PLAN**

Acceptance Criteria: **LTV STEEL TUBULAR PRODUCTS/GALVITE**

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

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Title: **CONDUIT FOR SAFETY CLASS WIRING**Characteristic: **All Rigid Conduit**Sample Size*: **REDUCED SAMPLING PLAN**Size / Acceptance Criteria: **Verify UL marking on the conduit sample lot.****Verify Size marking on the conduit sample lot or verify identifying dimensions on the conduit sample lot as follows:**

1/2 " / Nominal 0.622 ID

3/4" / Nominal 0.824 ID

1" / Nominal 1.049 ID

1 1/4" / Nominal 1.380 ID

1 1/2" / Nominal 1.610 ID

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

Characteristic: **Threaded Rigid Conduit Nipples, Manufacturer**Sample Size*: **REDUCED SAMPLING PLAN**Acceptance Criteria: **Conduit Pipe Products**

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

Characteristic: **Threaded Rigid Conduit Nipples**Sample Size*: **REDUCED SAMPLING PLAN**Size / Acceptance Criteria: **Verify UL marking on the sample lot.****Verify Size marking on the sample lot or verify identifying dimensions on the sample lot as follows:**

1/2" / Nominal 1/2"

3/4" / Nominal 3/4"

1" / Nominal 1"

1 1/2" / Nominal 1 1/2"

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

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<p>Characteristic: Threaded Rigid Conduit Bushed Nipples, Manufacturer</p> <p>Sample Size*: REDUCED SAMPLING PLAN</p> <p>Acceptance Criteria: Appleton Electric Company</p> <p>As Found: _____ Passed: Y / N (Circle)</p> <p>Receipt Inspection Plan / Report #: _____</p> <p>References (see Section 8): _____</p>
<p>Characteristic: Threaded Rigid Conduit Bushed Nipples</p> <p>Sample Size*: REDUCED SAMPLING PLAN</p> <p>ID Number / Acceptance Criteria: Verify UL marking on the sample lot.</p> <p>Verify part identifying marking on the sample lot or verify identifying Dimensions on the sample lot as follows:</p> <p style="padding-left: 40px;">CN-50 / Nominal 1/2"; "A" Dimension, Nominal 7/16"</p> <p style="padding-left: 40px;">CN-75 / Nominal 3/4"; "A" Dimension, Nominal 1/2"</p> <p style="padding-left: 40px;">CN-100 / Nominal 1"; "A" Dimension, Nominal 5/8"</p> <p style="padding-left: 40px;">CN-125 / Nominal 1 1/4"; "A" Dimension, Nominal 11/16"</p> <p style="padding-left: 40px;">CN-150 / Nominal 1 1/2"; "A" Dimension, Nominal 7/8"</p> <p>As Found: _____ Passed: Y / N (Circle)</p> <p>Receipt Inspection Plan / Report #: _____</p> <p>References (see Section 8): _____</p>
<p>Characteristic: Manufacturer, Threaded Rigid Conduit 3 Piece Connectors</p> <p>Sample Size*: REDUCED SAMPLING PLAN</p> <p>Acceptance Criteria: Appleton Electric Company</p> <p>As Found: _____ Passed: Y / N (Circle)</p> <p>Receipt Inspection Plan / Report #: _____</p> <p>References (see Section 8): _____</p>

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Title: **CONDUIT FOR SAFETY CLASS WIRING**Characteristic: **All Threaded Rigid Conduit 3 Piece Connectors**Sample Size*: **REDUCED SAMPLING PLAN**ID Number/Acceptance Criteria: **Verify UL marking on the sample lot.****Verify identifying marking on the sample lot or identifying dimensions on the sample lot as follows:****EC-50 / Nominal 1/2"; "A" Dimension, Nominal 1 7/16"****EC-75 / Nominal 3/4"; "A" Dimension, Nominal 1 9/16"****EC-100 / Nominal 1"; "A" Dimension, Nominal 1 11/16"****EC-125 / Nominal 1 1/4"; "A" Dimension, Nominal 2 1/8"****EC-150 / Nominal 1 1/2"; "A" Dimension, Nominal 2 3/16"**

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

Characteristic: **Manufacturer, Threaded Rigid Conduit Reducers**Sample Size*: **REDUCED SAMPLING PLAN**Acceptance Criteria: **Appleton Electric Company**

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

Characteristic: **All Threaded Rigid Conduit Reducers**Sample Size*: **REDUCED SAMPLING PLAN**ID Number/Acceptance Criteria: **Verify UL marking on the sample lot.****Verify identifying marking on the parts in the sample lot or verify identifying dimensions on the sample lot as follows:****RB75-50 / 3/4" - 1/2"****RB100-50 / 1" - 1/2"****RB150-50 / 1 1/2" - 1/2"****RB 100-75 / 1" - 3/4"****RB150-75 / 1 1/2" - 3/4"****RB125-100 / 1 1/4" - 1"****RB150-100 / 1 1/2" - 1"**

As Found: _____ Passed: Y / N (Circle)

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References (see Section 8): _____

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<p>Characteristic: Manufacturer, All Rigid Conduit Condulet Form 35</p> <p>Sample Size*: REDUCED SAMPLING PLAN</p> <p>Acceptance Criteria: Appleton Electric Company</p> <p>As Found: _____ Passed: Y / N (Circle)</p> <p>Receipt Inspection Plan / Report #: _____</p> <p>References (see Section 8): _____</p>
<p>Characteristic: All Rigid Conduit Condulet Form 35</p> <p>Sample Size*: REDUCED SAMPLING PLAN</p> <p>ID Number/Acceptance Criteria: Verify UL marking on the sample lot.</p> <p>Verify Size marking on the condulet sample lot or verify identifying dimensions on the condulet sample lot as follows:</p> <p style="padding-left: 40px;">LB/T/LR/LL-1/2" / Nominal 1/2"</p> <p style="padding-left: 40px;">LB/T/LR/LL-3/4" / Nominal 3/4"</p> <p style="padding-left: 40px;">LB/T/LR/LL-1" / Nominal 1"</p> <p style="padding-left: 40px;">LB/T/LR/LL-1 1/2" / Nominal 1 1/2"</p> <p>As Found: _____ Passed: Y / N (Circle)</p> <p>Receipt Inspection Plan / Report #: _____</p> <p>References (see Section 8): _____</p>
<p>Characteristic: Manufacturer, All Rigid Conduit Locknuts And Grounding Locknuts</p> <p>Sample Size*: REDUCED SAMPLING PLAN</p> <p>Acceptance Criteria: Appleton Electric Company</p> <p>As Found: _____ Passed: Y / N (Circle)</p> <p>Receipt Inspection Plan / Report #: _____</p> <p>References (see Section 8): _____</p>

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<p>Characteristic: All Rigid Conduit Locknuts And Grounding Locknuts</p> <p>Sample Size*: REDUCED SAMPLING PLAN</p> <p>ID Number/Acceptance Criteria: Verify UL marking on the sample lot.</p> <p>Verify Size marking on the locknut sample lot or verify identifying dimensions on the locknut sample lot as follows:</p> <p style="padding-left: 40px;">BL-50, GL-50 / Nominal 1/2"</p> <p style="padding-left: 40px;">BL-75, GL-75 / Nominal 3/4"</p> <p style="padding-left: 40px;">BL-100, GL-100 / Nominal 1"</p> <p style="padding-left: 40px;">BL-125, GL-125 / Nominal 1 1/4"</p> <p style="padding-left: 40px;">BL-150, GL-150 / Nominal 1 1/2"</p> <p>As Found: _____ Passed: Y / N (Circle)</p> <p>Receipt Inspection Plan / Report #: _____</p> <p>References (see Section 8): _____</p>
<p>Characteristic: Manufacturer, Rigid Conduit Beam Clamps</p> <p>Sample Size*: REDUCED SAMPLING PLAN</p> <p>Acceptance Criteria: Appleton Electric Company</p> <p>As Found: _____ Passed: Y / N (Circle)</p> <p>Receipt Inspection Plan / Report #: _____</p> <p>References (see Section 8): _____</p>
<p>Characteristic: All Rigid Conduit Beam Clamps</p> <p>Sample Size*: REDUCED SAMPLING PLAN</p> <p>ID Number/Acceptance Criteria: Verify identifying marking on the sample lot or verify identifying dimensions on the sample lot as follows:</p> <p style="padding-left: 40px;">BH-502 / 2" Size; Jaw Opening Nominal 15/16"</p> <p style="padding-left: 40px;">BH-503 / 2 1/2" Size; Jaw Opening Nominal 1 1/16"</p> <p>As Found: _____ Passed: Y / N (Circle)</p> <p>Receipt Inspection Plan / Report #: _____</p> <p>References (see Section 8): _____</p>
<p>Characteristic: Manufacturer, Liquidtight Flexible Steel Conduit.</p> <p>Sample Size*: REDUCED SAMPLING PLAN</p> <p>Acceptance Criteria: Thomas & Betts</p> <p>As Found: _____ Passed: Y / N (Circle)</p> <p>Receipt Inspection Plan / Report #: _____</p> <p>References (see Section 8): _____</p>

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Title: **CONDUIT FOR SAFETY CLASS WIRING**Characteristic: **All Flexible Steel Conduit**Sample Size*: **REDUCED SAMPLING PLAN**ID Number/Acceptance Criteria: **Verify UL marking on the conduit sample lot.****Verify Size marking on the conduit sample lot or verify identifying dimensions on the conduit sample lot as follows:**

Type LA-11 / Nominal 1/2" Diameter

Type LA-12 / Nominal 3/4" Diameter

Type LA-13 / Nominal 1" Diameter

Type LA-14 / Nominal 1 1/4" Diameter

Type LA-15 / Nominal 1 1/2" Diameter

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

Characteristic: **Manufacturer, Flexible Metal Conduit Connectors**Sample Size*: **REDUCED SAMPLING PLAN**Acceptance Criteria: **Thomas and Betts**

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

Characteristic: **All Flexible Metal Conduit Connectors**Sample Size*: **REDUCED SAMPLING PLAN**ID Number/Acceptance Criteria: **Verify UL marking on the sample lot.****Verify identifying marking on the sample lot or verify identifying dimensions on the sample lot as follows:**

5332 / Nominal 1/2" - "A" Dimension, Nominal 1 3/8"

5333 / Nominal 3/4" - "A" Dimension, Nominal 1 21/32"

5334 / Nominal 1" - "A" Dimension, Nominal 1 7/8"

5335 / Nominal 1 1/4" - "A" Dimension, Nominal 2 9/32"

5336 / Nominal 1 1/2" - "A" Dimension, Nominal 2 23/32"

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

Characteristic: **Manufacturer, Framing Channels/Pipe Straps**Sample Size*: **REDUCED SAMPLING PLAN**Acceptance Criteria: **Superstrut**

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

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Title: **CONDUIT FOR SAFETY CLASS WIRING**Characteristic: **All Framing Channels/ Pipe Straps**Sample Size*: **REDUCED SAMPLING PLAN**ID Number/Acceptance Criteria: **Half Slot Channel, A-1200-HS / Nominal 1 5/8" x 1 5/8"; 12 gage.****702 Series Pipe Straps: Verify identifying marking on the sample lot or verify identifying dimensions on the sample lot as follows:****702-1/2 / Pipe OD Nominal 0.840", 14 gage****702-3/4 / Pipe OD Nominal 1.050", 14 gage****702-1 / Pipe OD Nominal 1.315", 14 gage****702-1 1/4 / Pipe OD Nominal 1.660", 14 gage****702-1 1/2 / Pipe OD Nominal 1.900", 14 gage**

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

Characteristic: **Manufacturer, Fender Washers**Sample Size*: **REDUCED SAMPLING PLAN**Acceptance Criteria: **ABC Fasteners**

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

Characteristic: **Fender Washers**Sample Size*: **REDUCED SAMPLING PLAN**ID Number/Acceptance Criteria: **20004 / 1/4" x 1 1/4"****20008 / 3/8" x 1 1/2"****20015 / 1/2" x 2"**

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

Characteristic: **Manufacturer, Fasteners**Sample Size*: **REDUCED SAMPLING PLAN**Acceptance Criteria: **Powerstrut**

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

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Title: **CONDUIT FOR SAFETY CLASS WIRING**Characteristic: **Fasteners**Sample Size*: **REDUCED SAMPLING PLAN**ID Number/Acceptance Criteria: **PS 146 Continuous Threaded Rod / Nominal 3/8"**

/ Nominal 1/2"

/ Nominal 5/8"

/ Nominal 3/4"

PS RS Clamping Nut with Regular Spring / 1/4" x 20

/ 3/8" x 16

/ 1/2" x 13

/ 5/8" x 11

/ 3/4" x 10

/ 7/8" x 9

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

Characteristic: **Material Identification, All Items (11 items from Section 9-2)**Sample Size*: **REDUCED SAMPLING PLAN**Acceptance Criteria: **Steel**

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 7): _____

Characteristic: **Material Identification, Flexible Steel Conduit Jacket**Sample Size*: **REDUCED SAMPLING PLAN**Acceptance Criteria: **Flexible PVC Compound**

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

Characteristic: **Material Identification, Fender Washers**Sample Size*: **REDUCED SAMPLING PLAN**Acceptance Criteria: **Zinc Coated Steel**

As Found: _____ Passed: Y / N (Circle)

Receipt Inspection Plan / Report #: _____

References (see Section 8): _____

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SECTION 4 VERIFIED BY SPECIAL TEST

* See Attachment H of Desk Instruction for Sampling Size

Test To Be Performed by:

☐ Purchaser

☐ Supplier/Manufacturer**

☐ Other

Number of Items to be Tested: **Reduced Sampling Plan Was Selected Due To The Product History and Simplicity Of Product**

Test/Inspection Location:

Characteristic for Test: **Seismic Condition C - All Items (13 items from Section 9-2)**

Acceptance Criteria: **Maintain Critical Function Before, During, and After Seismic Event.**

Sample Size*: **Sample Size is NA because seismic verification of the installed conduit system with fittings, supports, etc, will be done by analysis. Physical testing is not anticipated.**

Actual Test Value:

Test Plan and Report #: _____ References (see Section 8): _____

Characteristic for Test:

Acceptance Criteria:

Sample Size*: **REDUCED SAMPLING PLAN**

Actual Test Value:

Test Plan and Report #: _____ References (see Section 8): _____

Characteristic for Test:

Acceptance Criteria:

Sample Size*: **REDUCED SAMPLING PLAN**

Actual Test Value:

Test Plan and Report #: _____ References (see Section 8): _____

** If Supplier/Manufacturer or Other, Refer to CGI Checklist-2 for Support Information

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Section 5 Test/Inspection Summary (Acceptance Method 1)											
1. SUMMARY OF VERIFIED CRITICAL CHARACTERISTICS, THEIR VERIFICATION METHODS, AND RESULTS											
ITEM DESCRIPTION:											
Critical Characteristics					Verification Results						
Critical Characteristics	Acceptance Criteria/Tolerances	ID	Function	Method T/IN	Procedure or RR#	Checklist ID	Number Tested	Number Failed	Verifying Organization	Printed Name Signature	Date
Manufacturer, All Rigid Conduit	LTV Steel Tubular Products/Galvite Verify UL marking on the conduit sample lot. Verify Size marking on the conduit sample lot or verify identifying dimensions on the conduit sample lot as follows: Nominal 0.622" ID Nominal 0.824" ID Nominal 1.049" ID Nominal 1.380" ID Nominal 1.610" ID	X		IN							
1/2" Rigid Conduit 3/4" Rigid Conduit 1" Rigid Conduit 1 1/4" Rigid Conduit 1 1/2" Rigid Conduit											
Manufacturer, All Rigid Conduit Nipples	Conduit Pipe Products Verify UL marking on the sample lot. Verify Size marking on the sample lot or verify identifying dimensions on the sample lot as follows: Nominal 1/2" Nominal 3/4" Nominal 1" Nominal 1 1/2"	X									
1/2"											
3/4"											
1"											
1 1/2"											

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		X	IN							
Manufacturer, All Threaded Rigid Conduit 3 Piece Connectors	Appleton Electric Company									
EC-50	Verify UL marking on the sample lot. Verify identifying marking on the sample lot or identifying dimensions on the sample lot as follows: Nominal 1/2" -"A" Dimension, Nominal 1 7/16"									
EC-75	Nominal 3/4" -"A" Dimension, Nominal 1 9/16"									
EC-100	Nominal 1" -"A" Dimension, Nominal 1 11/16"									
EC-125	Nominal 1 1/4" -"A" Dimension, Nominal 2 1/8"									
EC-150	Nominal 1 1/2" -"A" Dimension, Nominal 2 3/16"									

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Manufacturer, All Threaded Rigid Conduit Reducers	Appleton Electric Company Verify UL marking on the sample lot. Verify identifying marking on the parts in the sample lot or verify identifying dimensions on the sample lot as follows: 3/4" - 1/2" 1" - 1/2" 1 1/2" - 1/2" 1" - 3/4" 1 1/2" - 3/4" 1 1/4" - 1" 1 1/2" - 1"	X	IN							
RB75-50 RB100-50 RB150-50 RB100-75 RB150-75 RB125-100 RB150-100										
Manufacturer, Rigid Metal Conduit Condulet Form 35	Appleton Electric Company Verify UL marking on the sample lot. Verify Size marking on the conduit sample lot or verify identifying dimensions on the conduit sample lot as follows: Nominal 1/2" Nominal 3/4" Nominal 1" Nominal 1 1/2"	X	IN							
LB/T/LR/LL-1/2" LB/T/LR/LL-3/4" LB/T/LR/LL-1" LB/T/LR/LL-1 1/2"										

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Manufacturer, All Rigid Conduit Locknuts / Grounding Locknuts	Appleton Electric Company Verify UL marking on the sample lot. Verify Size marking on the locknut sample lot or verify identifying dimensions on the locknut sample lot as follows: Nominal 1/2" Nominal 3/4" Nominal 1" Nominal 1 1/4" Nominal 1 1/2"	X																	
BL-50, GL-50 BL-75, GL-75 BL-100, GL-100 BL-125, GL-125 BL-150, GL-150																			
Manufacturer, Rigid Metal Conduit Beam Clamps	Appleton Electric Company Verify identifying marking on the sample lot or verify identifying dimensions on the sample lot as follows: 2" Size, Jaw Opening Nominal 15/16" 2 1/2" Size, Jaw Opening Nominal 1 1/16"	X																	
BH-502 BH-503																			

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Manufacturer, All Flexible Steel Conduit	Thomas & Betts	X	IN						
Type LA-11	Verify UL marking on the conduit sample lot.	Nominal 1 1/2" Diameter							
Type LA-12	Verify Size marking on the conduit sample lot or verify identifying dimensions on the conduit sample lot as follows:	Nominal 3/4" Diameter							
Type LA-13		Nominal 1" Diameter							
Type LA-14		Nominal 1 1/4" Diameter							
Type LA-15		Nominal 1 1/2" Diameter							

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Manufacturer, Flexible Metal Conduit Connectors	Thomas and Betts	X	IN							
	Verify UL marking on the sample lot. Verify identifying marking on the sample lot or verify identifying dimensions on the sample lot as follows: Nominal 1/2" -"A" - Dimension, Nominal 1 3/8"									
5332	Nominal 3/4" -"A" - Dimension, Nominal 1 21/32"									
5333	Nominal 1" -"A" - Dimension, Nominal 1 7/8"									
5334	Nominal 1 1/4" -"A" - Dimension, Nominal 2 9/32"									
5335	Nominal 1 1/2" -"A" - Dimension, Nominal 2 23/32"									
5336										

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Manufacturer, Framing Channels/Pipe Straps	Superstrut	X	IN						
Half Slot Channel A-1200-HS	Nominal 1 5/8" x 1 5/8", 12 gage.								
702 Pipe Straps	Verify identifying marking on the sample lot or verify identifying dimensions on the sample lot as follows:								
702-1/2	Pipe OD Nominal 0.840", 14 gage								
702-3/4	Pipe OD Nominal 1.050", 14 gage								
702-1	Pipe OD Nominal 1.315", 14 gage								
702-1 1/4	Pipe OD Nominal 1.660", 14 gage								
702-1 1/2	Pipe OD Nominal 1.900", 14 gage								
Manufacturer, Fender Washer	ABC Fasteners	X	IN						
20004	1/4" x 1 1/4"								
20008	3/8" x 1 1/2"								
20015	1/2" x 2"								

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Manufacturer, Fasteners	Powerstrut	X	IN						
PS 146 Continuous Threaded Rod	Nominal 3/8" Nominal 1/2" Nominal 5/8" Nominal 3/4"								
PS RS Clamping Nut with Regular Spring.	1/4" x 20 3/8" x 16 1/2" x 13 5/8" x 11 3/4" x 10 7/8" x 9								
Material Identification:		X	IN, T						
All Size Rigid Metal Conduit,	Steel								
Threaded Rigid Metal Conduit, Nipples	Steel	X	IN, T						
Threaded Rigid Metal Conduit, Bushed Nipples	Steel	X	IN, T						
Threaded Rigid Metal Conduit, 3 Piece Connectors	Steel	X	IN, T						
Threaded Rigid Metal Conduit, Reducers	Steel	X	IN, T						
Threaded Rigid Metal Conduit, Condulet Form 35	Steel	X	IN, T						
Rigid Metal Conduit, Locknuts/Grounding Locknuts	Steel	X	IN, T						

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Rigid Metal Conduit, Beam Clamps	Steel	X																	
All Size Liquidtight Flexible Steel Conduit, Jacketing	Flexible PVC Compound	X																	
Flexible Steel Conduit, Connectors	Steel	X																	
Framing Channel 702 Pipe Straps	Steel	X																	
Fender Washer	Zinc Coated Steel	X																	
Fasteners, PS 146 Continuous Threaded Rod. PS RS Clamping Nut with Regular Spring.	Steel	X																	
Seismic Condition C	Maintain Critical Function Before, During, and After Seismic Event. Seismic verification of the installed conduit system will be provided by analysis.	X																	

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2. DISPOSITION OF UNVERIFIED OR FAILED CRITICAL CHARACTERISTICS			
Critical Characteristic		Disposition	
3. SIGNATURE INDICATES ALL CRITICAL CHARACTERISTICS VERIFIED SATISFACTORY OR ACCEPTABLY DISPOSITIONED AND COMMERCIAL GRADE DEDICATION IS SATISFACTORY AND COMPLETE.			
Testing Agency Approval:		BUYER VERIFICATION	
Testing Agency QA Engineer:		Design Authority:	Date
		QA Engineer:	Date

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SECTION 6: CONTACTS / PHONE NUMBERS	
Name	Phone
Design Authority	()
QA	()
QC	()
Cog - Engineer	()
CGI Engineer	()
Procurement Engineer	()
Other	()
SECTION 7: SUPPORTING DOCUMENTATION FOR THIS CHECKLIST	
Initial Procurement Documents	For Critical Characteristics
☐ Drawings:	
☐ Manuals (specify type & number):	
☐ Design Calculations	
☐ Installation Instructions	
☐ Operation Instructions	
☐ Calibration Instructions	
☐ Manufacturer's Recommended Spare Parts List	
☐ Other:	
Procurement Documents	
☐ Certificate of Conformance/Compliance	
☐ Seismic Qualification Certificate	
☐ Environmental Qualification Certificate	
☐ Test Report (s):	
☐ Inspection Report (s):	
☐ CMTRs for ASME Pressure Retaining Materials	
☐ Valve Seat Leakage Report	
☐ Weld Records	
☐ Material Traceability Record	
☐ Other:	

DISTRIBUTION SHEET

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