

**PREPARATION OF INSPECTION &
TEST PLANS FOR CIVIL &
STEELWORKS, REV.0**

**FOSTER WHEELER ENERGY LTD
WORK PRACTICE
CONSTRUCTION OPERATIONS**

ITEM	ACTIVITY	CONTROL DOCS	PROCEDURE REQUIRED	REPORT FORM/ CHECKLIST NUMBER	HOLD	RESPONSIBILITY			COMMENTS
						C	FW	CTCI	
1. DOCUMENTS REQUIRING APPROVAL									
1.1	Submission of applicable Civils Works Procedure(s)	<ul style="list-style-type: none"> • 13530-43C1 • 13530-43C1 • 13530-43C1 • 13530-43C2 • 13530-42C1 • 13530-43C1 • 13530-43C1 • 13530-43C1 	<ul style="list-style-type: none"> • General Concrete Works Method Statement • General Rebar Works Method Statement • General Formworks Method Statement • General Earthworks Works Method Statement • Piling Method Statement. • Pile Load Test • Pile Lengthening Method Statement • General Survey Setting Out Procedure • Procedure for Concrete Placement fore the Large 		No work to proceed without approved procedures	X	R ¹	W	

¹ R = Review of Inspection & Test Report
W = Full Witness
(W) = Random/Partial Witness
I = Inspection ,Inspection & Test

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		<ul style="list-style-type: none"> • 13530-45C1 • 13530-43C2 • XF11A-000-001 • 13530-45C1 	<ul style="list-style-type: none"> • Sewer Drainage Method Statement • Trenches & Duct Works Method Statement • Welding Procedures • NDT Procedures • Hydro Test procedures • Road and Pavement Method Statement • Steelwork Erection Method Statement • Concrete Fire Protection Procedure • Shop Drawings • Bar Cutting & Bending Schedule • Materials Submissions List 						
1.2	Preparation and Submission of Applicable Civil Works Method Statements		Method Statements for Main Activities		Method statements for main activities to be submitted for approval prior to Work Commencement.	X	R	I	

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1.3	Weld Procedure Specifications		Submission of all weld procedure specifications, procedure qualification records required		Procedures and qualifications to be reviewed and approved prior to performing any welding or NDT work	X	R	I	
1.4	Welder Qualification Test	<ul style="list-style-type: none"> 13530-88A1 ASME IX 				X	I	I	
1.5	Dye Penetrant Procedure	<ul style="list-style-type: none"> 13530-88A1 ASME IX 	Dye Penetrant Procedure			X	R	I	
1.6	Radiographic Procedure	<ul style="list-style-type: none"> 13530-88A1 ASME IX 	Radiographic procedure			X	R	I	
1.7	MPI Procedure	<ul style="list-style-type: none"> 13530-88A1 ASME IX 	MPI procedure			X	R	I	
1.8	UT Procedure	<ul style="list-style-type: none"> 13530-88A1 ASME IX 	UT procedure		Procedures and qualifications to be reviewed and approved prior to performing any welding or NDE work	X	R	I	
1.9	PMI Procedure	<ul style="list-style-type: none"> 13530-80A1 	PMI procedure			X	R	I	
1.10	PWHT Procedure	<ul style="list-style-type: none"> 13530-88C2 	PWHT procedure			X	R	I	

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1.11	Pressure Test Procedure	<ul style="list-style-type: none"> ASME B31.3 13530-88C2 	Pressure test procedure			X	R	I	
1.12	Calibration Procedures		Calibration procedures			X	R	I	
1.13	Painting Procedures	<ul style="list-style-type: none"> 13530-83A1 	Painting procedures			X	R	I	
1.14	NDT Operator Qualifications	<ul style="list-style-type: none"> ASNT or CSWIP 				X	R	I	<ul style="list-style-type: none"> Technicians certificates RT, UT, MT and PT
1.15	Materials Approval					X	R	I	
1.16	Coating & Wrapping	<ul style="list-style-type: none"> 13530-83A4 	Coating & Wrapping Procedure			X	R	I	
2	SURVEY WORKS								
2.1	Acceptance of the Survey Establishment & References	<ul style="list-style-type: none"> Drawings, details of existing underground services 		<ul style="list-style-type: none"> FM-001 Fm-002 	Excavation not to commence until an agreement of survey and soils reports and checks existing U/G services is reached.	X	R	I	<ul style="list-style-type: none"> Review final copies for final survey, soil investigation report etc identify precautions to protect existing facilities etc.

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3. EXCAVATION									
3.1	Setting out		Survey Setting-Out Procedure	<ul style="list-style-type: none"> FM-001 Fm-002 		X	R	I	<ul style="list-style-type: none"> At the beginning Stage of the Project , References Points shall be Agreed . Joint Survey is required.
3.2	Calibration of instruments								<ul style="list-style-type: none"> Prior to Works Commencement andRegularlyChecks/ Calibrations.
3.3	Classification of materials	13530-43C1			Maximum Dry Density & Optimum Moisture Content must be obtained as an indicator to control compaction in the field.	X	R	I	<ul style="list-style-type: none"> Suitable excavated material shall comply to 7.7 Suitable Excavated Material , Specification for Earthworks.
3.4	Disposal of excavated material	13530-43C1		<ul style="list-style-type: none"> FM-003 	No materials to leave site without permission	X	R	I	<ul style="list-style-type: none"> Identification of areas for stockpiling or disposal
3.5	Replacement of Over Excavation or unsuitable materials revealed.	13530-43C1	General Excavation Method Statement shall be approved prior to Work Commencement.	<ul style="list-style-type: none"> FM-003 	Gradation of Fill Material shall be compliance to Specification for Earth Works , 13530-43 C2 , Engineering Standard.	X	R	I	<ul style="list-style-type: none"> Suitable excavated material shall comply to 7.7 Suitable Excavated Material , Specification for earth Works .

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4. PILING									
4.1	Pile Load Test & Pile Driving	13530-42C1	Method Statements for Pile Driving shall be approved prior to Work Commencement..	<ul style="list-style-type: none"> FM-015 	Piling Sequence shall be approved prior to Piling.	X	R	I	<ul style="list-style-type: none"> Pile Load Test for the Selected Piles shall be conducted prior to piling. Test Piles shall be agreed by the Engineer prior to Testing. The Test shall comply to " General Specification for Piling Section 6.12 , 7.0 Engineering Standard.
4.2	Preparation of pile lengthening yard	13530-42C1	Design Calculation for Joint Connection of Piles to be reviewed prior to confirm manufacturing.			X	R	I	<ul style="list-style-type: none"> General Specification for Piling Section 6.13.3 Engineering Standard.
4.3	Welding Procedures including Pile Handling		Method Statement for Lengthening and Handling shall be approved prior to Work Commencement.	<ul style="list-style-type: none"> FM-014 	Approval to be Granted prior to Work Commencement	X	R	I	<ul style="list-style-type: none"> Until approval is obtained no welding is allowed.
4.4	Welder Qualification	ASME IX		<ul style="list-style-type: none"> FM-014 	Certified Welders to be Submitted Prior to Welding.	X	R	I	<ul style="list-style-type: none"> Only certified welders are allowed for the works
4.5	Weld Maps	Shop Drawings			Shop Drawings to be approved prior to Welding	X	R	I	<ul style="list-style-type: none"> Welding identification for each weld

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4.6	Set out Piling Positions	13530-42C1	Setting Out Procedure to be included in Method Statements for Pile Driving Piles Positioning to be reviewed and agreed by Joint Survey.	<ul style="list-style-type: none"> FM-002 FM-015 		X	I	I	Procedures & Driving Sequence to be agreed prior to Piling.
4.7	Drive/drill piles including "as built" Survey			<ul style="list-style-type: none"> FM-015 		X	I	I	
4.8	Reinforcing Steel Materials Approval	13530-43C1	General Rebar Works Method Statement shall be approved prior to Work Commencement.		Material Control for Rebar Works shall be included in General Rebar Works Method Statement shall be approved prior to Work Commencement.	X	R	I	<ul style="list-style-type: none"> Material Certificates Sampling to be in compliance with 5.3 Reinforcement , Specification for Concrete Works Engineering Standard.
4.9	Reinforcement cutting bending and fixing	13530-43C1	General Rebar Works Method Statement shall be approved prior to Work Commencement		Bending schedule	X	R	I	<ul style="list-style-type: none"> Bar List Schedule to be Approved prior to Cutting and Bending.
4.10	Approval of Cement	13530-43C1			Manufacturer Certificate required for each delivery	X	R	I	<ul style="list-style-type: none"> Comply with ASTM C94. All The trial mixes proposed are in compliance with the requirement stated in clause 6.4 Concrete Mixes ,Specification for Concrete Works.
4.11	Sampling and Approval of Aggregates	13530-43C1			Approval of Sources including Tests prior to use	X	R	I	<ul style="list-style-type: none"> Sampling will be regularly done to ensure its conformance still maintained

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4.12	Approval of Water for Concrete Mixes	13530-43C1			Water Test for its Properties shall be submitted for approval prior to use	X	R	I	<ul style="list-style-type: none"> To be in compliance with ACI 318 and Specification for Concrete Works , Engineering Standard.
4.13	Approval of Admixture	13530-43C1			Certificate Required from Independent Laboratory	X	R	I	<ul style="list-style-type: none"> To be in compliance with ASTM C494
4.14	Design Mixes	13530-43C1			Trial Mixes to be performed prior to use.	X	R	I	<ul style="list-style-type: none"> To comply with ASTM C94. All The trial mixes proposed are in compliance with the requirement stated in clause 6.4 Concrete Mixes ,Specification for Concrete Works.
4.15	Concrete mixing batching and transportation		General Concrete Works Method Statement shall be approved prior to placing order.		Approval of batching plant prior to use	X	R	I	<ul style="list-style-type: none"> Tools & Apparatus etc to be calibrated/certified
4.16	Concrete placing, compaction and vibration		General Concrete Works Method Statement shall be approved prior to placing order.	<ul style="list-style-type: none"> FM-006 FM-007 FM-008 FM-009 	Final inspection of pile and rebar. Vibration equipment during placing	X	I	I	<ul style="list-style-type: none"> Slump test each load, cubes in accordance with specification

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4.17	Protection and Curing	13530-42C1	Method Statements for Pile Driving shall be approved prior to Work Commencement	<ul style="list-style-type: none"> FM-008 FM-009 		X	I	I	<ul style="list-style-type: none"> To comply with ASTM C94. All trial mixes proposed to be in compliance with the requirement stated in clause 6.8 , Specification for Piling , Engineering Standard.
5. FILL, BACKFILL & COMPACTION									
5.1	Selection of Fill Material	13530-43C2				X	R	I	<ul style="list-style-type: none"> Gradation , Maximum Dry Density and Optimum Moisture Content shall comply to Section 13.2 , Specification for Earthworks , Engineering Standard.
5.2	Placement and Compaction	13530-43C2		<ul style="list-style-type: none"> FM-004 		X	I	I	<ul style="list-style-type: none"> shall comply to Section 13.5, 13.6,13.7,13.8,13.9,13.10,13.11,13.12,13.13,13.14 Specification for Earthworks , Engineering Standard.
6 CONCRETE WORKS									
6.1	Formwork Design	13530-43C1				X	R	I	<ul style="list-style-type: none"> Shall be in compliance with the requirement stated in Section 8.0 , Specification for Concrete Works , Engineering Standard.

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6.2	Formwork Construction	13530-43C1	General Formwork Method Statement shall be approved prior to Work Commencement.	<ul style="list-style-type: none"> FM-006 		X	I	I	<ul style="list-style-type: none"> Check dimensions, datums and benchmarks, shape, profile and ties prior to concrete pour. Shall be in compliance with the requirement stated in Section 8.0 , Specification for Concrete Works , Engineering Standard.
6.3	Reinforcing Steel	13530-43C1	General Rebar Works Method Statement shall be approved prior to Work Commencement	Mill Certificates shall arrive with each lot of delivery.		X	I	I	<ul style="list-style-type: none"> Material Certificate and Sample Test is required to confirm its conformance.
6.4	Bar Cutting & Bending	13530-43C1			Schedules for installation, bending or welding required before use	X	I	I	<ul style="list-style-type: none"> Bar Cutting & Bending Shall be submitted for approval prior to Work Commencement.
6.5	Approval of Cement	13530-43C1			Manufacturer Certificate required for each delivery	X	R	I	<ul style="list-style-type: none"> comply with ASTM C94. All The trial mixes proposed are in compliance with the requirement stated in clause 6.4 Concrete Mixes ,Specification for Concrete Works.
6.6	Sampling and Approval of Aggregates	13530-43C1			Approval of Sources including Tests prior to use	X	R	I	<ul style="list-style-type: none"> Sampling will be regularly done to ensure its conformance still maintained
6.7	Approval of water for concrete mixes	13530-43C1		Water analysis report	Approval of sources including testing prior to use in concrete mixes	X	R	R	
6.8	Approval of Admixture	13530-43C1			Certificate Required from Independent Laboratory	X	R	I	<ul style="list-style-type: none"> To be in compliance with ASTM C494

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6.9	Design Mixes	13530-43C1			Trial Mixes to be performed prior to use.	X	R	I	<ul style="list-style-type: none"> To comply with ASTM C94. All The trial mixes proposed are in compliance with the requirement stated in clause 6.4 Concrete Mixes ,Specification for Concrete Works.
6.10	Concrete Mixing Batching and Transportation	13530-43C1	General Concrete Works Method Statement shall be approved prior to placing order.		Batching Plant to be approved prior to use	X	R	I	<ul style="list-style-type: none"> Tools & Apparatus etc to be calibrated/certified.
6.11	Concrete Placing, Compaction and Vibration	13530-43C1	General Concrete Works Method Statement shall be approved prior to placing order.	<ul style="list-style-type: none"> FM-006 FM-007 FM-008 FM-009 	Final inspection of formwork and rebar, weather conditions., Concrete sampling & Slum test before pour, Vibration during placement	X	I	I	
6.12	Protection and Curing	13530-43C1	Method Statements for Pile Driving shall be approved prior to Work Commencement			X	I	I	<ul style="list-style-type: none"> To comply with ASTM C94. All trial mixes proposed to be in compliance with the requirement stated in clause 6.8 , Specification for Piling , Engineering Standard.
8.13	Cube Testing	13530-43C1			Concrete Test results. Random Test by Independent Laboratory	X	R	I	<ul style="list-style-type: none"> To follow General Concrete Works Method Statement

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6.14	Embedded Items	13530-43C1		<ul style="list-style-type: none"> FM-006 	Setting out Procedure	X	R	I	<ul style="list-style-type: none"> Check of templates and bolt settings. Cross check shall be done regularly.
7	TRENCHES & DUCTWORK								
7.1	Setting out	<ul style="list-style-type: none"> Layout drawings 		<ul style="list-style-type: none"> FM-002 	Agreed setting out points	X	R	I	
7.2	Installation of underground duct banks, pull pits, conduits and manholes	<ul style="list-style-type: none"> Layout drawings 13530-43C2 	Method Statement for Trenches & Ductwork	<ul style="list-style-type: none"> FM-002 FM-003 		X	R	I	
7.3	Trench excavation	<ul style="list-style-type: none"> Layout drawings 13530-43C22 		<ul style="list-style-type: none"> FM-002 FM-003 	Compaction Test at the bottom is accepted.	X	R	I	

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7.4	Backfill and compaction	<ul style="list-style-type: none"> • Layout drawings • 13530-43C22 		<ul style="list-style-type: none"> • FM-004 		X	R	I	
8. STEELWORK									
8.1	Welding procedures			FM-014	Approved welding procedures	X	R	I	
8.2	Welder qualification	ASME IX				X	R	I	
8.3	Welder performance	Welders daily performance record				X	R	I	
8.4	Weld maps	Construction drawings			Welders identification for each weld	X	R	I	
8.5	NDT	Construction drawings				X	I	I	
8.6	Erection marking	46C1				X	W	I	
8.7	Erection and setting out	46C1				X	I	I	

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8.8	Painting				Surface preparation, Dry film thickness	X	I	I	
8.9	Steelwork inspection and acceptance	46C1				X	W	I	
9.	CONCRETE FIRE PROTECTION								
9.1	Concrete Fire Protection Application	<ul style="list-style-type: none"> 13530-43C3 				X	W	I	
10	ROADWAYS & PAVING								
10.1	Setting Out	<ul style="list-style-type: none"> Layout drawings 13530-43C2 		<ul style="list-style-type: none"> FM-002 	Agreed setting out reference	X	I	I	
10.2	Compaction Inspection	<ul style="list-style-type: none"> Layout drawings 13530-43C2 		<ul style="list-style-type: none"> FM-003 FM-007 	Agreed for Maximum Dry Density & Optimum Moisture Results to control Field Compaction	X	W	I	
11.	GROUTING MATERIALS & WORKMANSHIP								

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11.1	Preparation curing and placement	<ul style="list-style-type: none"> 13530-43C1 13530-43C8 			Supplier to be Approved prior to use.	X	I	I	
12.	EARTHING CABLES & RODS								
12.1	Installation and Testing					X	W	I	Material approval if contractor supplied
13.	UNDERGROUND PIPING (CARBON STEEL)								
13.1	Piping fabrication	<ul style="list-style-type: none"> 13530-88C2 			Visual fit-up	X	I	I	
13.2	Existing services	<ul style="list-style-type: none"> As-built drawings 			Approval before excavating	X	I	I	
13.3	Welding procedures (carbon steel)	<ul style="list-style-type: none"> 13530-88C2 			Approved welding procedures	X	R	I	
13.4	Welder qualification	<ul style="list-style-type: none"> ASME IX 			Approved welders	X	R	I	
13.5	Welder performance	<ul style="list-style-type: none"> Welders daily performance record 				X	R	I	
13.6	Weld maps	<ul style="list-style-type: none"> Isometric Drawings 			Welders identification for each weld	X	R	I	

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13.7	NDT	<ul style="list-style-type: none"> Isometric Drawings 				X	R	I	
13.8	Piping erection	<ul style="list-style-type: none"> Isometric Drawings 			Hold until release for connection	X	I	I	
13.9	Pre-hydrotest inspection				Completed isometric fabrication packs	X	W	I	
13.10	Hydrotesting	<ul style="list-style-type: none"> Test packs 	Hydrotest procedure		Pre-test inspection and approval to test	X	W	I	
13.11	Coating and wrapping	<ul style="list-style-type: none"> 13530-83A4 	Coating/wrapping procedure		Holiday test	X	W	I	Material to be approval prior to use.
13.12	Air and water tests (non-pressurised drainage and sewer systems)				Pretest inspection	X	W		Manholes and catchbasins included
14.	UNDERGROUND PIPING (NON METALLIC)								
14.1	Setting Out	Layout Drawings				X	W		
14.2	Excavation	13530-45C1				X	I		
14.3	Formation of trench					X	I		Random inspection
14.4	Check invert levels of trench					X	W		
14.5	Installation of concrete/non-metallic pipe to manufacturers instructions	13530-45C1				X	I		Materials approval if contractor supplied
14.6	Check connections are aligned and tight	13530-45C1				X	I		

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14.7	Hydrotest on closed systems	13530-45C1				X	W		Hydrotest of manholes and catchbasins included
14.8	Flushing of open systems	13530-45C1				X	W		
14.9	Backfill and compaction	13530-45C1				X	I		
14.10	Visual inspection for obstructions	13530-45C1				X	I		
14.11	Manholes fitted and sealed as appropriate	13530-45C1				X	I		
14.12	Gratings fitted as appropriate	13530-45C1				X	I		