Bechtel Processing Pad – INSPECTION AND TEST PLAN

Details							
ITP Activity:	Embankment Construction			**Project:**	EVA Copper	**Date Lot Opened:**	
ITP Number:	EVAMP001-THS-4000-QA-ITP-0016	**Rev. No.**	A	**Contract Number:**		**Date Lot Closed:**	
Lot Number:				**Client:**	Harmony		
Location or Area:	Processing Pad			**Client Reference:**		**JSA/SWMS Ref:**	
Chainage / Coordinates:				**Contractor / Subcontractor / Supplier:**		**SOP Reference:**	

No.	Inspection / Test Point	Responsible	Method	Conformance Criteria	Specification Clause	Frequency	Verification from Thiess / Inspector (H/W/R/M)				Records or Comments
							THIESS (Initial)		Inspector (Initial)		
1	**Pre-Construction**										
1.	Drawings supplied most current IFC	ENG	Visual	Reviewed drawing register	Reviewed drawing register	Prior to works	HP		W		
2.	Define Lot dimensions	ENG	Visual	Allocate Lot No to ITP and update Lot register	Lot register. EVAMP001-THS-CV-SPE-0001 EVAMP001-THS-CV-SPE-0002	Prior to works	HP		W		
3.	Lot Register/ WBS submitted and approved	ENG	Visual	Approved WBS	Approved WBS	Prior to works	WP		W		

4.	Underlying lot & ITP signed off and conforming	ENG	Visual	Topsoil stripping ITP signed off	Approved QMP. Approved ITP	Prior to works	HP		W		
2	**Construction**										
5.	General Fill Embankment Material Properties	ENG	Test	Class A: - WPI < 1200 - PI > or = 7% - % passing AS 0.075 sieve 15 - 30% Class B: - WPI 1200 to < 2200 Class C: - WPI 2200 to 32200	EVAMP001-BEC-3920-CV-SPE-0001 Rev0 Clause 3.8.2.1 General Embankment Fill	1 test per 5,000m3	HP		W		NATA Test Results
6.	Select Fill Embankment Material Properties	ENG	Test	Select Fill Material: - CBR > or =15 - Max. aggregate size: 40mm - Linear Shrinkage: max. 7.5 - Liquid Limit: max. 40 - Plasticity Index: 4 to 14 - Weighted Plasticity Index: < 560 - Swell < or = 0.5% - Particle size distribution as per Bechtel EW Specification Table 3-6: Select Fill Particle Size Distribution Envelopes	EVAMP001-BEC-3920-CV-SPE-0001 Rev0 Clause 3.8.2.2 Select Embankment Fill	Site Won Material: 1 test per 1,000m3 Quarry Sourced Material: 1 test per 2,500t	HP		W		NATA Test Results
7.	Structural Fill Embankment Material Properties	ENG	Test	Properties of Coarse components (any component retained on the AS 0.425mm sieve) Type A & B: - 10% fines value (wet): min. 85kN - Wet/dry strength variation: max. 35%	EVAMP001-BEC-3920-CV-SPE-0001 Rev0 Clause 3.8.2.5 Structural Fill	Particle size distribution, Liquid Limit, Plasticity Index. Minimum testing frequency: 1 test per	HP		W		NATA Test Results

				- Washington degradation: min. 35 - Flakiness index: max. 40% Properties of Fine components (any component passing through the AS 0.425mm sieve) Type A: - Liquid Limit: max. 25% - Plasticity Index: max. 6% - Plasticity Index x % of whole sample passing the AS 0.425mm sieve: max. 150 - Linear Shrinkage: max. 8% Properties of Fine components (any component passing through the AS 0.425mm sieve) Type B: - Liquid Limit: max. 35% - Plasticity Index: max. 12% - Plasticity Index x % of whole sample passing the AS 0.425mm sieve: max. 360 - Linear Shrinkage: max. 8% Particle size distribution as per Bechtel Specification Table 3-11: Structural Fill Particle Size Distribution Envelopes CBR - Type A: min. 60 - Type B: min. 35		1,000m3, and 1 per work are and 1 per change of material.					

8.	Lined Pond Embankment Material Properties	ENG	Test	- % passing 37.5mm sieve > or = 80% - % passing 0.075mm sieve > or = 30% - Maximum particle size 125mm - Plasticity Index > or = 7% - Liquid Limit 20 to 50% - Emerson Class > 3	EVAMP001-BEC-3920-CV-SPE-0001 Rev0 Clause 3.8.2.6 Pond Embankment Fill	Not specified	HP		W		NATA Test Results
9.	Remove & Replace Unsuitable Material (as directed)	SV ENG SURV	Visual & Survey	Where directed by the client's representative remove and replace unsuitable material and dispose to waste at an approved location or as shown on the drawings prior to placing embankment fill.	EVAMP001-BEC-3920-CV-SPE-0001 Rev0 Clause 3.5.6 Unsuitable Material	As required	HP		W		Survey Records
10.	Subgrade Preparation Under Embankment Fill	SV ENG SURV	Test & Survey	Natural surfaces under embankment fill shall be tyned, moisture conditioned and compacted to a dry density ratio of not less than 98% standard compaction.	EVAMP001-BEC-3920-CV-SPE-0001 Rev0 Clauses 3.8.3 Preparation of Natural Ground & 3.10 Testing	Normal level of testing minimum frequency: 1/500m2 & 3/Visit Reduced level of testing minimum frequency: 1/1,000m2 & 3/visit	HP		W		NATA Test Results Survey Records
11.	Embankment Construction, Layer Thickness, Placement & Compaction	SV ENG SURV	Test & Survey	Depths of layers shall not exceed the capability of the proposed plant and in any case shall not exceed 300mm uncompacted. Layers in the top 300 mm below subgrade level for	EVAMP001-BEC-3920-CV-SPE-0001 Rev0 Clauses 3.9.3 Compaction Standards, 3.9.3.1	Operations >5,000m3: Normal level of testing minimum frequency:	HP		W		NATA Test Results Survey Records

				foundations, including the foundation of generators in Independent Power Provider, shall be compacted to not less than 100% of the maximum dry density (standard compaction) with moisture content +/- 2% of OMC. Layers for Earthpads, the top 150mm of Road Embankments, Foundations in the top 300mm below subgrade level, Pond Embankments, and the Crushed Ore Stockpile to be compacted to 98% of the maximum dry density (standard compaction) with moisture content +/- 2% of OMC. Fill material other than that referred to above shall be compacted to a dry density ratio of not less than 95% of the maximum dry density (standard compaction) with moisture content +/- 2% of OMC. Rockfill or mechanical interlock method shall not be used in areas proposed for buildings and other structural works, nor within a zone 600 mm below subgrade level for road embankments. Minimum thickness of uncompacted layers: Greater of 150mm or 1.5 times the max. rock	Compaction for Embankment (Compacted Layer method), 3.9.3.2 Compaction for Rockfill (Mechanical Interlock Method), 3.9.4.3 Compaction and Moisture Content & 3.10 Testing	1/500m2 & 3/Visit Reduced level of testing minimum frequency: 1/1,000m2 & 3/visit Operations 500m3 to 5,000m3: Normal level of testing minimum frequency: 1/500m2 & 3/Visit Reduced level of testing minimum frequency: 1/1,000m2 & 3/visit Operations <500m3: Normal level of testing minimum frequency: 1/500m2 & 3/Visit Reduced level of testing					

				size. Max. thickness of uncompacted layers shall not exceed those nominated in Table 3-14 of the Bechtel EW Spec.		minimum frequency: 1/1,000m2 & 3/visit					
12.	Subgrade Preparation Under Structural Fill	SV ENG SURV	Visual & Test & Survey	The top 300 mm below subgrade level for foundations shall be compacted to not less than 100% maximum dry density (standard compaction). For subgrades under pavements and buildings / structures, the materials exposed at subgrade level of cuttings are to have a minimum CBR of 8. Should the CBR be less than 8, the following subgrade treatments shall be applied: CBR 2 to 7 – excavate 150 mm below subgrade level and replace with compacted selected fill (minimum CBR 10). CBR 1 – excavate 250 mm below subgrade level and replace with compacted selected fill (minimum CBR 10). Proof rolling of the formation which is to receive structural fill and pavement structure shall be witnessed by a	EVAMP001-BEC-3920-CV-SPE-0001 Rev0 Clause 3.9.4.1 Subgrade Preparation for Structures and Pavement, 3.9.4.3 Compaction and Moisture Content & 3.10 Testing	Proof roll as required CBR testing frequency not specified	HP		HP		NATA Test Results Survey Records Visual Inspection Record

				civil/geotechnical engineer to ensure that no soft spots remain in the compacted subgrade. Any areas that show signs of visible movement under the rear axle of an on-highway type 10,000L water truck will be rejected. The rear axle of the water truck shall be loaded to at least 8.0 tonnes and fitted with dual tyres. The minimum tyre pressure of the water truck shall be 600 kPa and the testing shall be conducted at a speed in the range of 3-10km/h. Both the Company and the Contractor's representatives shall walk alongside the testing water truck to observe any surface deformation.							
13.	Structural Fill Construction, Layer Thickness, Placement & Compaction	SV ENG SURV	Test & Survey	Depths of layers shall not exceed the capability of the proposed plant and in any case shall not be less than 75mm or exceed 200mm uncompacted. The top 300 mm below subgrade level for foundations shall be compacted to not less than 100% maximum dry density (standard compaction).	EVAMP001-BEC-3920-CV-SPE-0001 Rev0 Clauses 3.9.4.2 Layer Thickness for Structural Fills, 3.9.4.3 Compaction and Moisture Content .	In-situ Density, Maximum Dry Density(standard compaction) & Density Index Minimum testing frequency: 1 test per 2,500m2 or 1 test per 500m3 distributed	HP		W		NATA Test Results Survey Records

						evenly through the full depth and area, and 2 per work area, and 1 per change of material					
14.	As-built Survey of completed surface	ENG SURV	Survey	Survey to be completed of the finished surface to confirm construction as per the lines and levels shown on the drawings in accordance with the following tolerances: <u>Vertical Tolerances</u> Road subgrade & building/structure pads: -25 to +0mm All other earthworks: +/-25mm <u>Horizontal Tolerances</u> Adjacent Structure: As per the structure Not adjacent structure (apart from those listed in Section 3.11.1.1 & Section 3.11.1.2 of the spec): -50 to +150mm Substructure concrete to be placed directly against an excavated vertical surface: -10 to +50mm	EVAMP001-BEC-3920-CV-SPE-0001 Rev0 Clause 3.11 Construction Tolerance	As required	HP		HP		Survey report

				Road width: -0 to +250mm Open channel: -0 to +50mm Any point on earthworks surface except any of the above: +/-50mm <u>Grade Tolerances</u> Roads & Pad/embankment: +/-0.25% Open Channel: +/-0.1%							
3	**Post Construction**											
15.	Works completed and updated ITP/ Lot Register/ MDR and close out of GDP	ENG	Visual	ITP closed. Approved MDR	- EVAMP001 -EVA-7340-PE-PRM-0001 - EVA PMP	As required	HP		HP		

☐ **Conformance to Specification**	☐ **Requires Re-Work:** (Provide Details):		☐ **Non-Conformance**	**NCR No:**

Approved by THIESS QA Representative		**Date**
Name (print):		
Signature:		

Approved by THIESS Project Manager		**Date**
Name (print):		
Signature:		

Approved by Client		**Date**
Name (print):		
Signature:		

RESPONSIBILITY		**METHOD**		**VERIFICATION TYPE**		**ITP REVISIONS**			
Symbol	**Legend**	**Symbol**	**Legend**	**Symbol**	**Legend**	**Rev No.**	**Amendment Details**	**Date**	**Approver**

C	Client	W	Written	HP	Hold				
SV	THIESS Supervisor	A	Application	W	Witness				
Eng	THIESS Engineer	D	Design	R	Review				
Surv	Surveyor	S	Survey Data	M	Monitor				
SC	Subcontractor	V	Visual						
PM	Project Manager	T	Test						
CM	Construction Manager	C	Certificate						
MC	Material Controller	TA	Test / Approval						
ENV	Enviro officer	M	Measure						

Please transfer information into THIESS Data System ‘Inspection and Test’ Register.