SUDAN INFRASTRUCTURE SERVICES PROJECT

TASK ORDER 2:
ROADS AND BRIDGES
QUALITY ASSURANCE PLAN

May 2009

This document was produced for review by the United States Agency for International Development (USAID). It was prepared by The Louis Berger Group, Inc.

Contract No. 650-I-03-06-00010-01

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1.0 Amendments to the QAP Register

Date	Revision	Author	Description of Change	Approved By
May 28, 09	-	C.Kapernick	Initial Issue	C. Kapernick

2.0 Preparation and Distribution of QAP

The Quality Assurance Plan (QAP) has been prepared by the Task Order 2 Manager in collaboration with the relevant experts in their field as required. One controlled copy shall be distributed to each road project.

The Project Engineer shall be responsible for the distribution on-site to the Task Order (TO) Manager, Project Engineer, Materials Engineer, Surveyor and the plan made available to the Inspectors and Engineers on-site. The Project Engineer shall ensure that all manual holders receive any and all updates.

This QAP is for LBG project staff to control quality of the product on projects. This plan does not take away the contractual requirements of the Contractor to produce and follow a project Quality Control Plan that is to be approved by the TO Manager.

The revision of quality assurance forms does not necessitate the reissue of the QAP.

S/N	Name	Date	Signature of Receipt

3.0 Purpose of QA System

The purpose of the Quality Assurance System is to ensure that all works being constructed by the Contractor are properly documented, tested and surveyed as required by the Contract conditions. It provides the mechanism whereby only works that comply with these requirements are certified for payment.

The purpose of the Quality Assurance Plan is to provide guidance and direction for project personnel to perform the necessary tasks to verify that the quality of the Contractor's work complies with the specification and drawings and that the works are documented clearly for traceability.

The process is described in three-steps.

1. Before work can commence, and if applicable, the Contractor submits to the Engineer a Request for Approval (RFA) which includes material and drawing compliance and approval.
    - Request for Approval: Source Approval

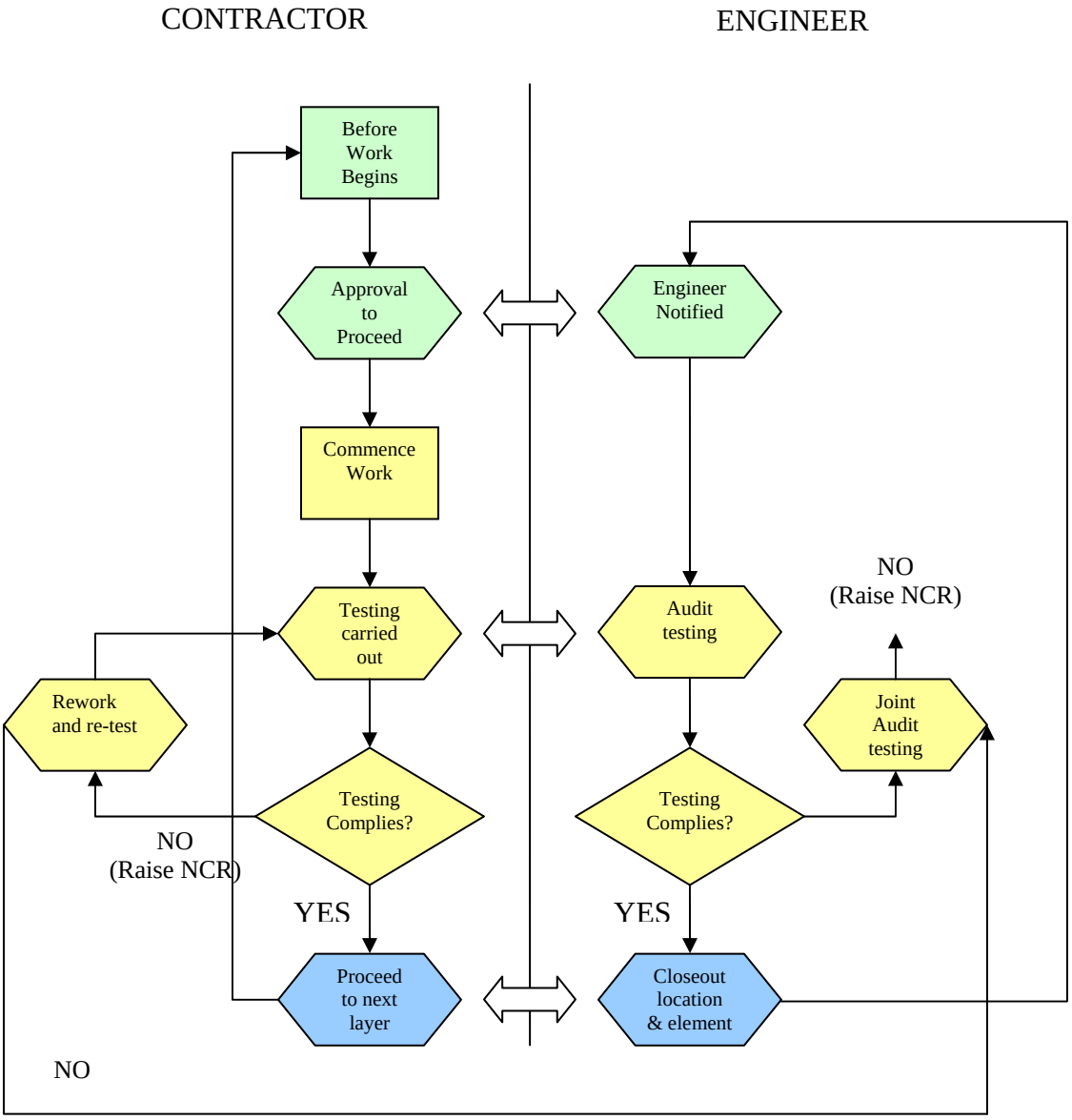
2. Secondly an Approval to Proceed (ATP) form must be submitted to ensure that the works underlying the proposed works are in a complying condition to allow the successive works to proceed. Once the Engineer is satisfied that the previously completed works, documentation and procedures are in place and conform to the relevant standards, specifications, and drawings then the Engineer grants the Contractor approval to begin or continue with its works
    - Approval to Proceed: Hold point for works

3. The third step of the process involves the testing of the actual works including geometric, material and source compliance as well as construction process (e.g. field density testing) compliance. Two types of forms are used to document this stage in the quality process;
    - Request for Survey: Geometric compliance
    - Request for Testing: Materials and Source compliance

If at any stage during the quality assurance system the Contractor fails to perform works which do not meet the specifications declared in the Contract, the Engineer will reject the works. A Non-Conformance Report (NCR) will be issued to document the rejection (Refer to Appendix F) of works. The Contractor will re-work the rejected works until re-testing can prove conformity to the specifications of the Contract.

The Engineer will carry out audit checks to verify the Contractor's test results. The frequency of the audit testing will be determined by the Engineer and will be based upon the confidence level gained by the Engineer of the Contractor's quality testing program as assessed by the Engineer's audit testing.

4.0 QA Process Summary Flowchart

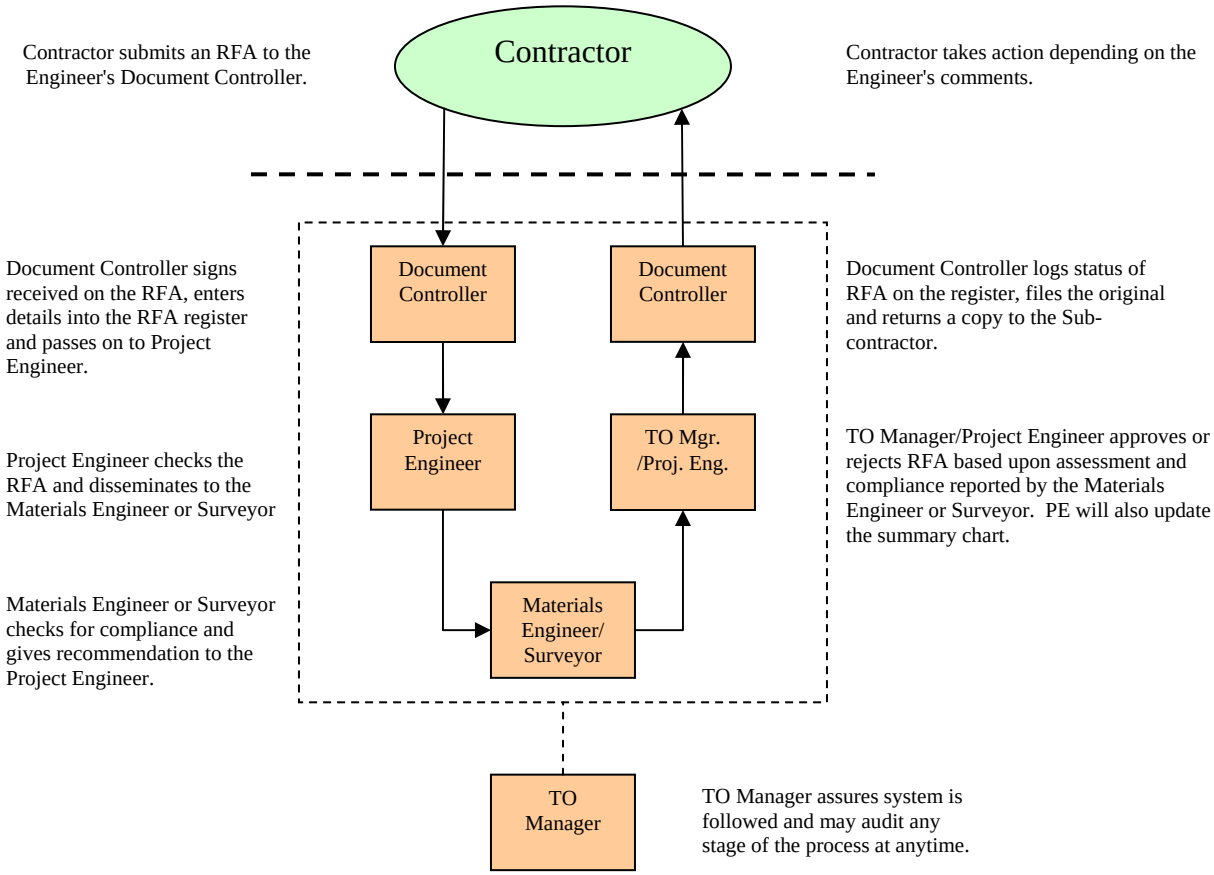


5.0 Components of the QA Process

5.1 Request For Approval (RFA)

As stated in the specifications, the Contractor must gain approval of source materials, drawings; job mixes etc. before use in the permanent works. The Contractor shall submit for approval in writing through the RFA form the particular approval the Contractor requires. The Engineer will review, assess and analyze whether the RFA meets the specifications and will approve or reject stating reasons why.

5.1.1 Process Flow



5.2 Authority To Proceed (ATP)

The authority to proceed is a submission made by the Contractor for an approval to proceed. Before the approval to proceed is granted the Engineer must be satisfied that all documentation and procedures are in place and conform to the relevant requirements and that all previously completed works or underlying works are suitable to allow successive works to proceed. The Engineer then either grants the Contractor approval to begin his works or advises what issues are outstanding in order for the requested works to proceed.

Examples of what the Engineer must be satisfied with prior to granting an ATP includes but not limited to approved for construction drawings, ensuring safety certificates are attained, compliance of source materials has been approved and that preceding works are kept and maintained in its approved condition.

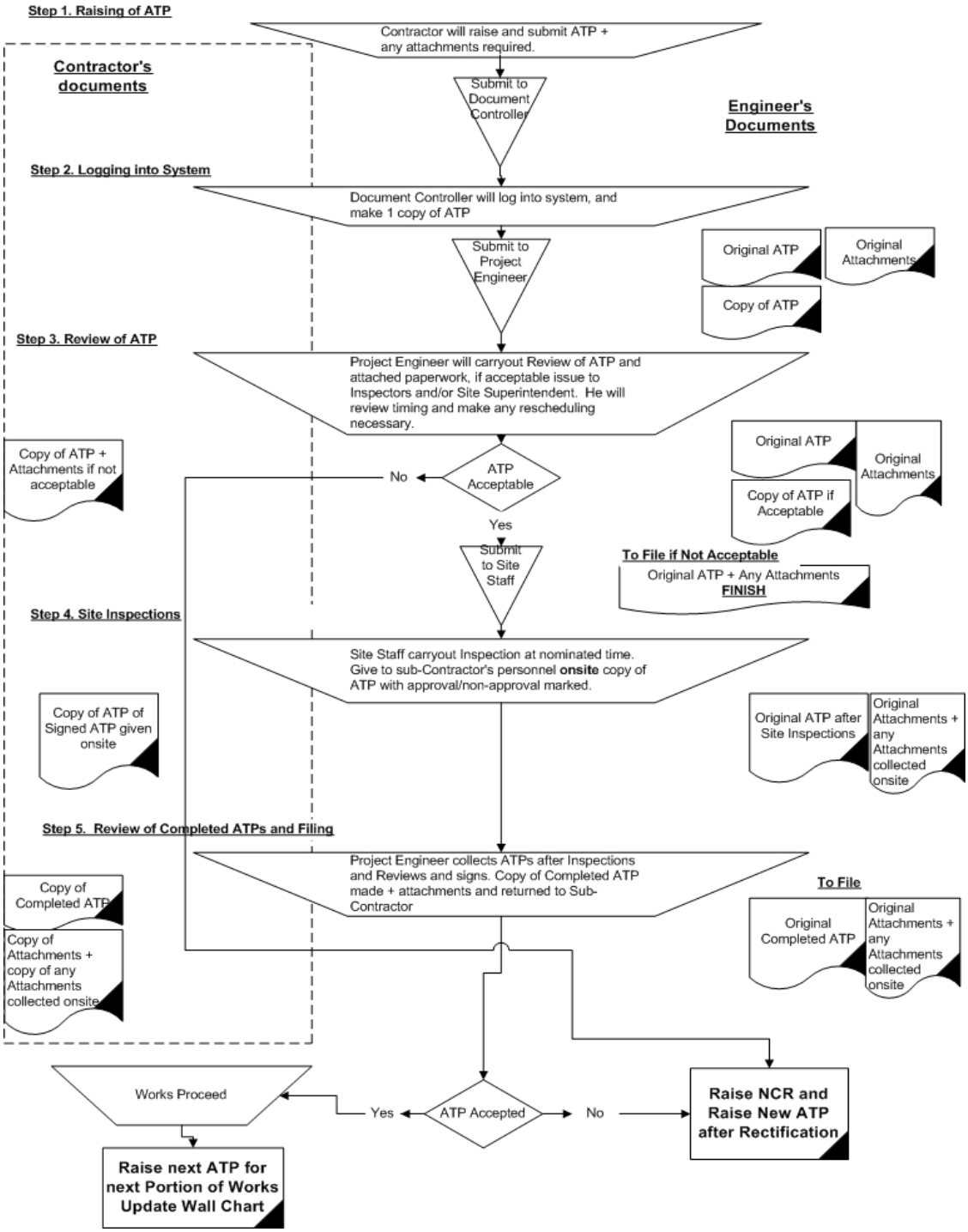
5.2.1 Document Flow

In order for the Quality Assurance System to function effectively, then it is important that the timely submittal and processing of the ATP's occurs. To that effect it is the responsibility of all parties to ensure the time limits are adhered to.

- ATP's shall be submitted in a timely manner by the Contractor but will be submitted no later than the agreed time on the day prior to the stated inspection dates.
- Works will be ready for inspection at the time stated by the Contractor or as agreed to by the Engineer prior to the inspection.
- Works covered by the ATP will not proceed prior to the time stated or agreed to by Engineer.
- All signed ATP's will be returned to the Contractor not later than the agreed time on the day after the stated inspection date.
- Where the Engineer's representative does not attend the inspection at the stated or agreed time, then the ATP is 'deemed' to be approved by the Engineer shall be responsible for ensuring that all inspections and tests to demonstrate that the works comply with the requirements of the Contract Documents are carried out.
- Similarly when a copy of the ATP is not returned to Contractor by the agreed time on the date following the inspection, the ATP is also 'deemed' to be approved. The Engineer shall be responsible for ensuring that all inspections and tests to demonstrate that the works comply with the requirements of the Contract Documents are carried out.
- Where the Contractor does not afford the Engineer the opportunity of inspecting the works covered by submitting an ATP in accordance with these guidelines, then these works shall be at the option of the Engineer either removed at the Contractor's expense or not accepted for payment.

5.2.2 Document Control

The Contractor and Engineer shall ensure that the following flowchart is followed and the original and copies of the ATP's are distributed as follows:



5.3 Request For Testing (RFT)

Notification of any testing to be carried out on the completed sections of works undertaken by the Contractor will be communicated to the Engineer by the submission of an RFT. The purpose of the RFT is to notify the Engineer of testing that will be performed by the Contractor to enable the Engineer to inspect, monitor and verify the accuracy and credibility of the testing.

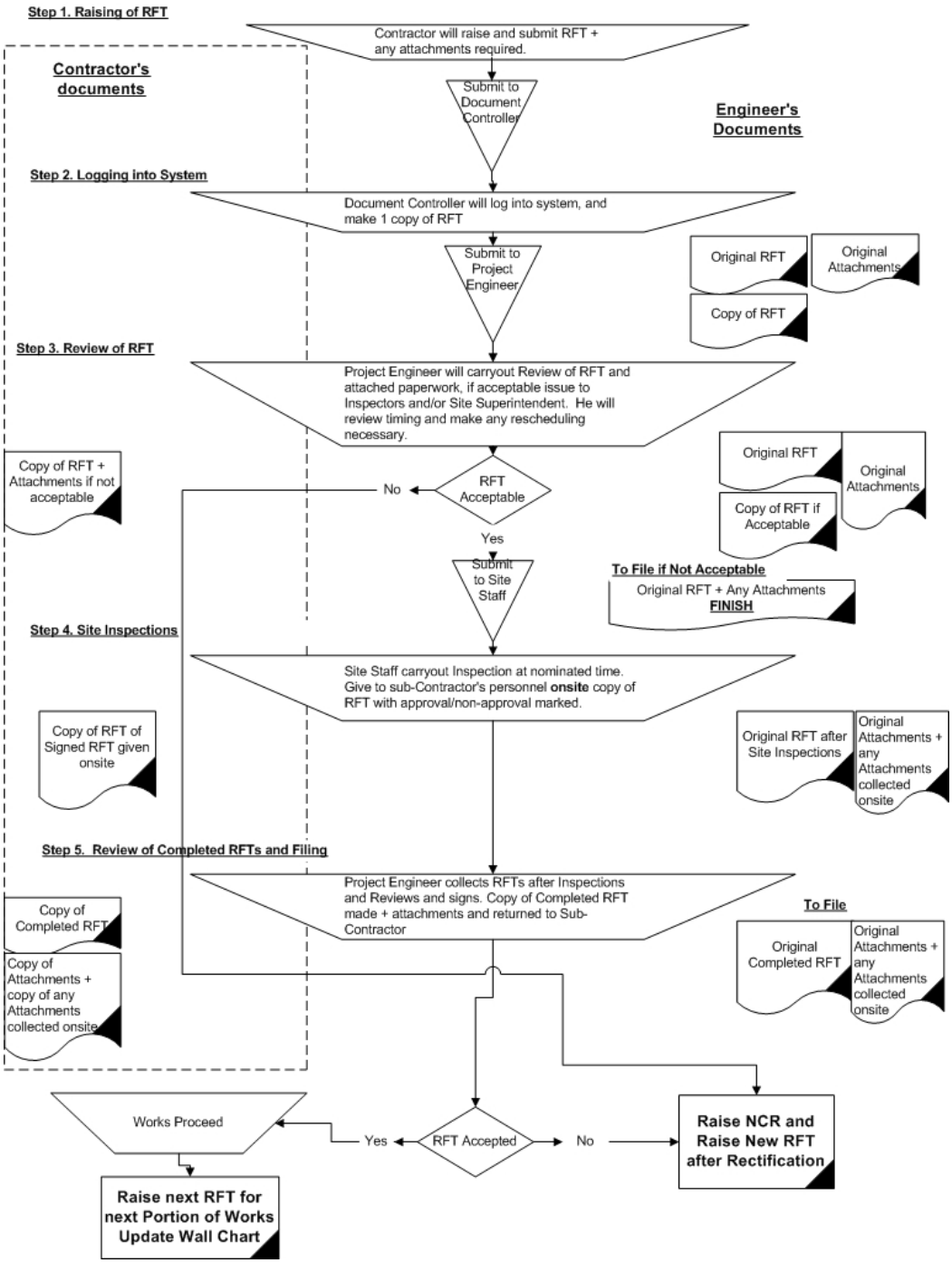
5.3.1 Document Flow

In order for the testing system to function effectively and for delays not to occur, then it is important that the timely submittal and processing of the RFT's occurs. To that effect it is the responsibility of all parties to ensure the time limits are adhered to.

- RFT's shall be submitted in a timely manner by the Contractor but will all be submitted by the agreed time on the day prior to the stated inspection dates.
- Works will be ready for inspection at the time stated by the Contractor or as agreed to by the Engineer.
- Works covered by the RFT will not proceed prior to the time stated or agreed to by Engineer.
- All signed RFT's will be returned to the Contractor not later than the agreed time on the day after the stated inspection date.
- Where the Engineer's representative does not attend the inspection at the stated or agreed time, then the RFT is 'deemed' to be approved by the Engineer, who shall be responsible for ensuring that all inspections and tests to demonstrate that the works comply with the requirements of the Contract Documents are carried out.
- Similarly when a copy of the RFT is not returned to Contractor by the agreed time on the date following the inspection, the RFT is also 'deemed' to be approved. The Engineer shall be responsible for ensuring that all inspections and tests to demonstrate that the works comply with the requirements of the Contract Documents are carried out.
- Where the Contractor does not afford the Engineer the opportunity of inspecting the works covered by submitting an RTF in accordance with these guidelines, then these works shall be at the option of the Engineer either removed at the Contractor's expense or not accepted for payment

5.3.2 Document Control

The Contractor and Engineer shall ensure that the following flowchart is followed and the original and copies of the RFT's are distributed as follows:



5.4 Request For Survey (RFS)

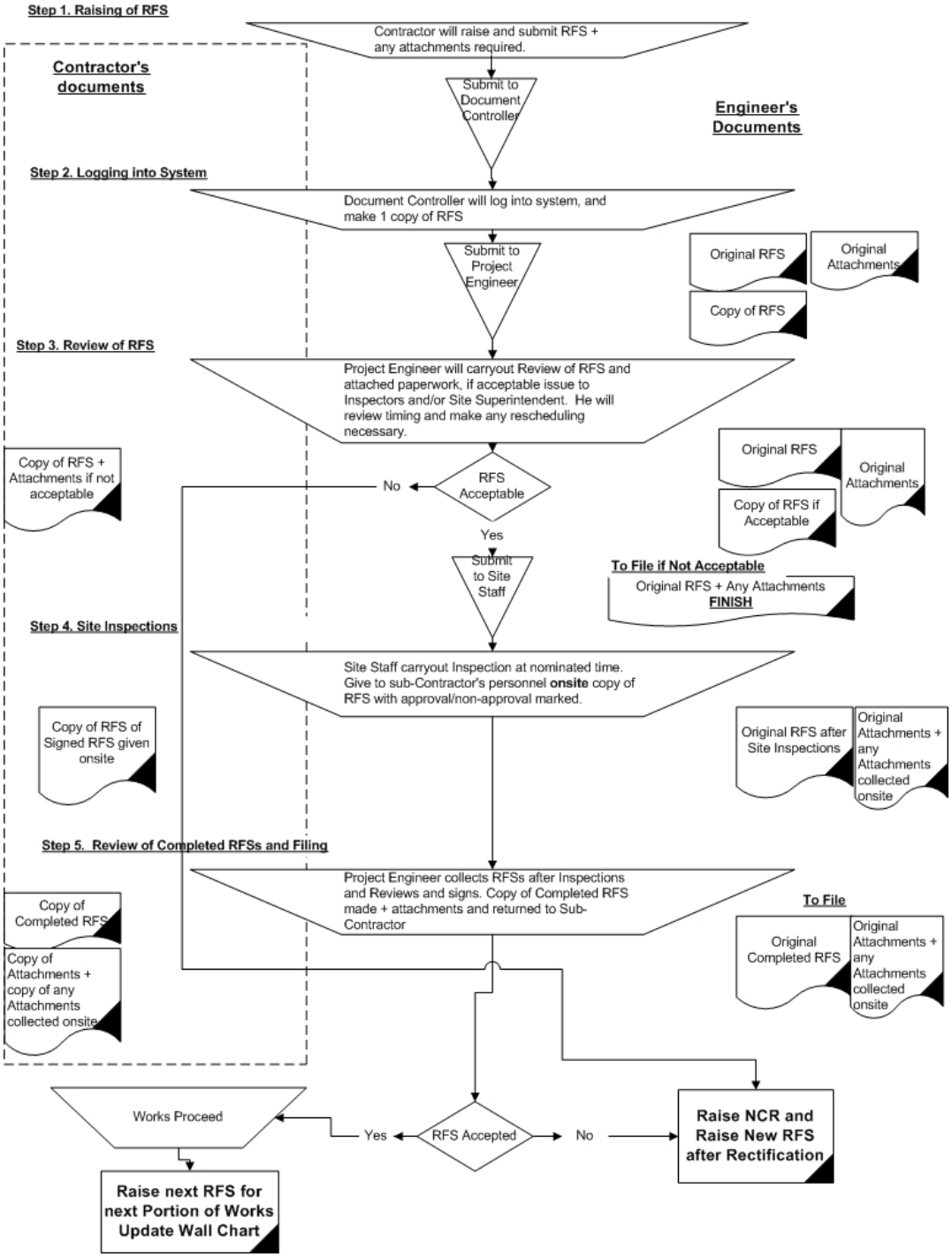
To complete the quality control loop, dimensional tolerance checks must be carried out on finished works as required by specifications. A Request for Survey (RFS) is to be submitted by the Contractor to the Engineer for checking of the works. Works cannot be covered up until the Engineer has carried out the necessary survey checks on the works.

In order for the survey personnel to function effectively and to prevent delays, then it is important that the timely submittal and processing of the ATP's occurs. To that effect it is the responsibility of all parties to ensure the time limits are adhered to.

- RFS's shall be submitted in a timely manner by the Contractor but will all be submitted by the agreed time on the day prior to the stated inspection dates.
- Works will be ready for inspection at the time stated by the Contractor or as agreed to by the Engineer.
- Works covered by the RFS will not proceed prior to the time stated or agreed to by Engineer.
- All signed RFS's will be returned to the Contractor not later than the agreed time on the day after the stated inspection date.
- Where the Engineer's representative does not attend the inspection at the stated or agreed time, then the RFS is 'deemed' to be approved by the Engineer, who shall be responsible for ensuring that all inspections and tests to demonstrate that the works comply with the requirements of the Contract Documents are carried out.
- Similarly when a copy of the RFS is not returned to Contractor by the agreed time on the date following the inspection, the ATP is also 'deemed' to be approved. The Engineer shall be responsible for ensuring that all inspections and tests to demonstrate that the works comply with the requirements of the Contract Documents are carried out.
- Where the Contractor does not afford the Engineer the opportunity of inspecting the works covered by submitting an RFT in accordance with these guidelines, then these works shall be at the option of the Engineer either removed at the Contractor's expense or not accepted for payment.

5.4.1 Document Control

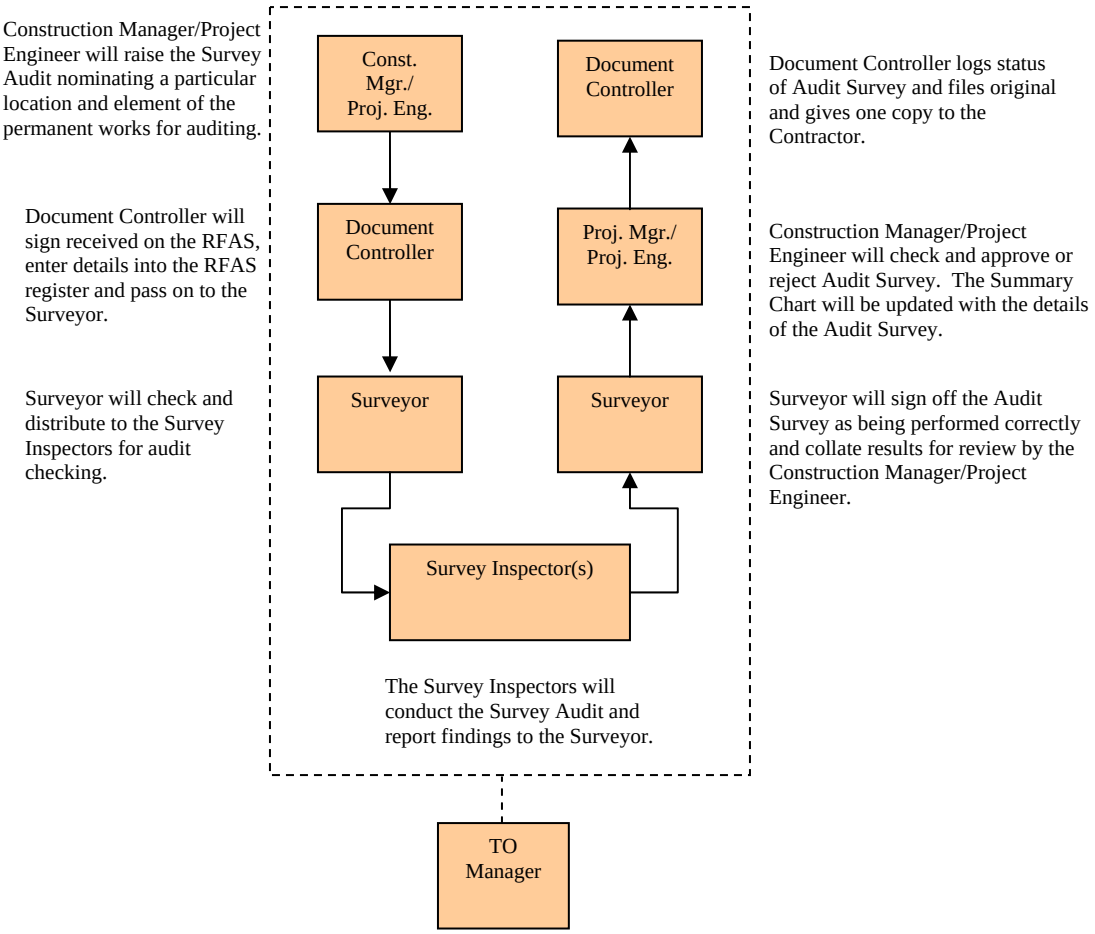
The Contractor and Engineer shall ensure that the following flowchart is followed and the original and copies of the RFT's are distributed as follows:



5.5 Request For Audit Survey (RFAS)

Survey auditing is the check on the Contractor's survey works performed by the Engineer. The frequency and location of the audit surveying is to be determined by the Construction Manager or Project Engineer in consultation with the TO Manager. If audit checks on a particular element and location of works indicate the same results as the Contractor, the works can be closed out as verified. If however there are discrepancies between the Engineer's audit survey checks and Contractor's survey results, a joint audit survey will be conducted. If a joint audit survey proves a non-compliance has occurred, the Contractor will perform whatever re-work necessary until the affected works complies with specifications.

5.5.1 Document Flow



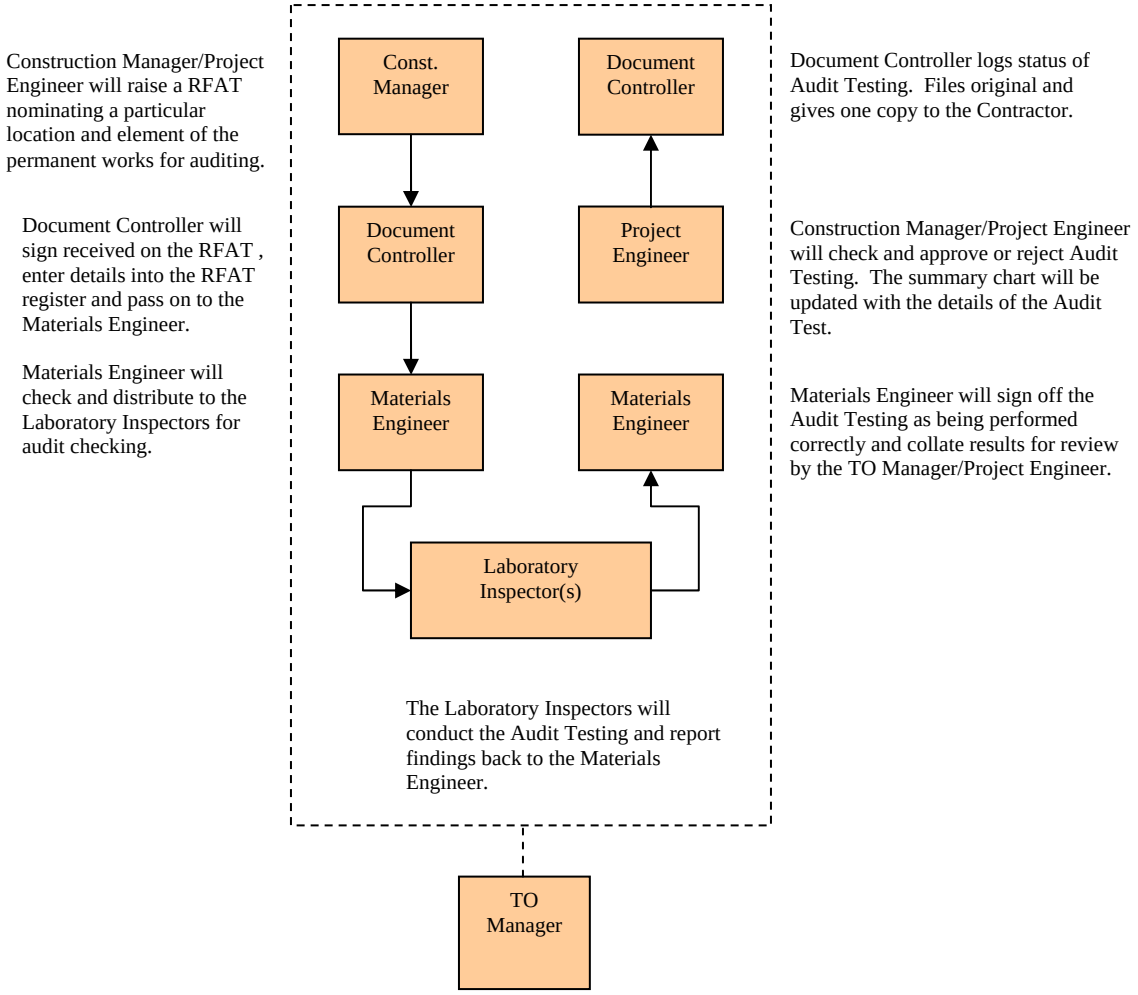
If the results of the audit survey either do not comply or do not correlate with results as submitted by the Contractor, the Surveyor shall immediately inform the Project Engineer and Construction Manager. The Construction Manager will review, in consultation with the TO Manager, these results and he will instruct that joint parallel survey be carried out to resolve the issue. This survey must be carried out as a matter of priority such that works are not delayed.

Audit Survey results by themselves (i.e. not as a result of a joint audit survey) shall not be used to reject the Contractor's works unless at the express direction of the TO Manager.

5.6 Request For Audit Testing (RFAT)

The Construction Manager or Project Engineer in consultation with the TO Manager may order an audit test at anytime during the project to test source compliance, material compliance, density checking or any other test the Construction Manager may deem as necessary to verify the Contractor's work. Testing will initially be carried out independently of the Contractor. If however the audit testing indicates that a section of the Contractor's work cannot be verified, a joint audit test will be carried out. Results shall be mutually agreed between the Engineer and Contractor and if necessary the disputed section shall be re-worked and re-tested until the works conforms.

5.6.1 Document Flow



If the results of the audit testing either do not comply or do not correlate with results as submitted by the Contractor, the Material's Engineer shall immediately inform the Project Engineer and Construction Manager. The Construction Manager will review, in consultation with the TO Manager, these results and he will instruct that joint parallel

testing be carried out to resolve the issue. This testing must be carried out as a matter of priority such that works are not delayed.

Audit Test results by themselves (i.e. not as a result of a joint audit survey) shall not be used to reject the Contractor's works unless at the express direction of the TO Manager.

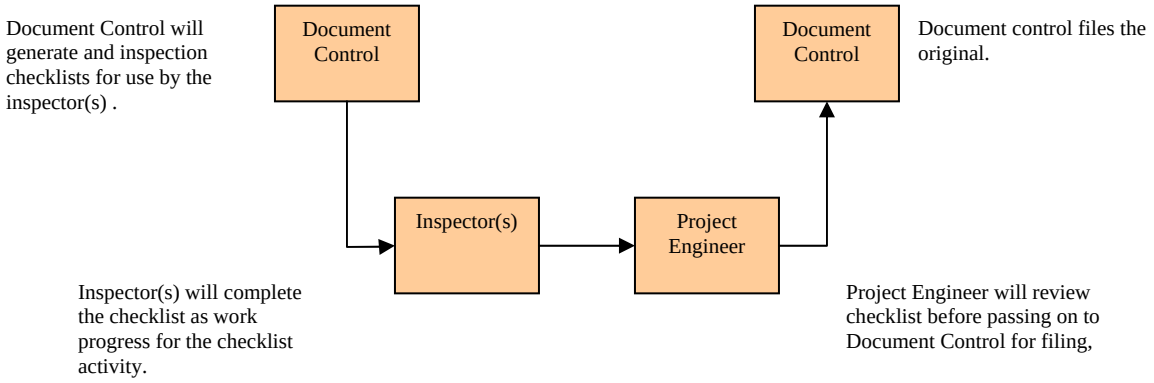
5.7 Inspection Test Plans (ITP)

The Inspection Test Plans (ITP) detail the required testing and frequency required for a particular activity. It is important the ITP contains references to the acceptance criteria and frequency of sampling from the specifications. The ITP will be attached to the back of the inspection checklists for the reference of the inspectors on-site. Refer to Appendix C for ITP's of the works.

5.8 Inspection Checklists (IC)

Inspection Checklists generally form part of the Inspection Test Plans and are used by the inspectors checking the works. For each ITP there may be a number of checklists used as supporting documents with each required to be verified before the referenced hold point on the ITP can be released. The inspection checklists are also used for but not limited to goods delivered to site that require verification of quality, quantity, manufacture, size, source, etc. The inspection checklist is used as a step by step pro forma to ensure all items have been verified as acceptable. Once the Inspection Checklist has been completed and the inspector is satisfied that all items meet the relevant standards, drawings or specifications then that checklist can be signed off as complete. These Checklists should be attached to the relevant ATP by the field inspector prior to submission of the ATP.

5.8.1 Document flow



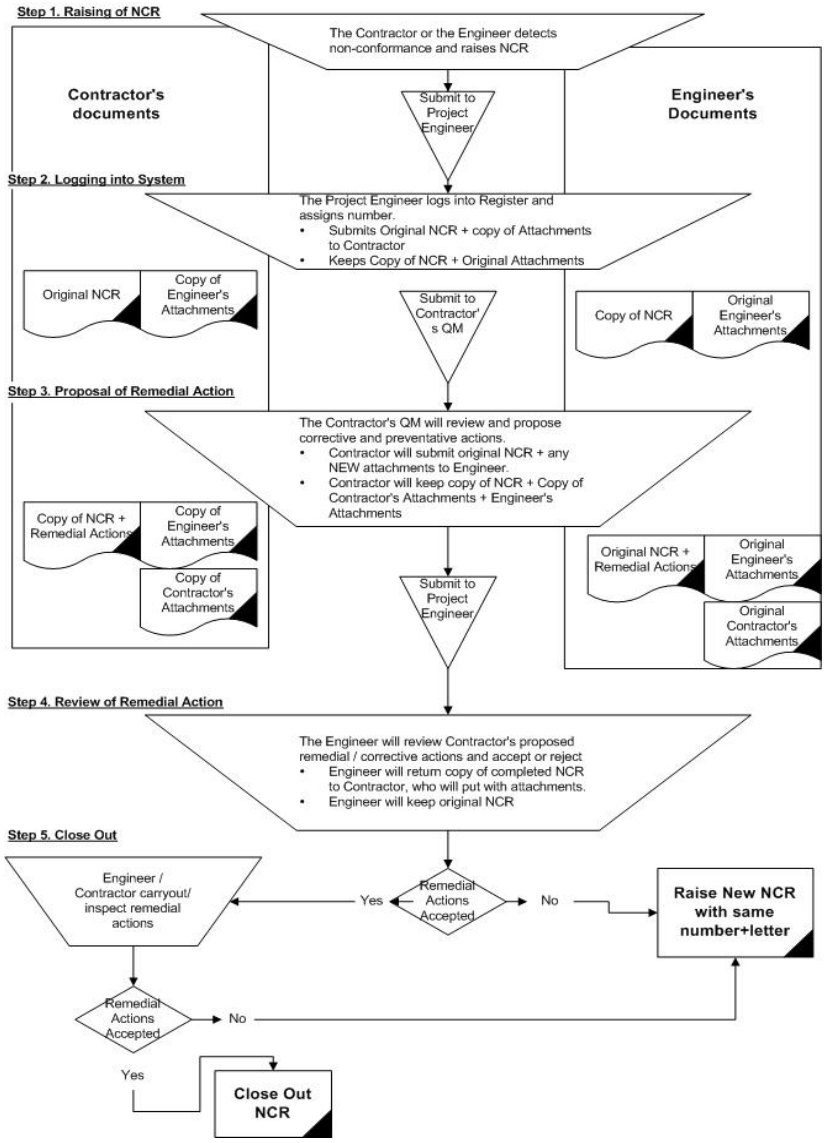
5.9 Summary Chart

A summary chart is to be displayed in LBG's office to be maintained by the Project Engineer. It is to contain the major activities of the Contract with status of the ATP's and Requisition Submittals displayed for each major activity as well as UXO removal/de-mining, drawing approvals etc. An example can be found in Appendix G.

5.10 Non Conformance Reports

The purpose of the Non-Conformance Report (NCR) is to effectively document works which for any reason whatsoever do not comply with the requirements of the Contract Documents. Secondarily, NCR's also ensure that these works are isolated until effective rectification works are carried out, inspected and where necessary tested to ensure that they demonstrate compliance. The third major function of the NCR reports is to ensure that any deflective works are not paid for until rectification works are carried out and the works conform to the requirements of the contract documents.

The status of the NCR will be shown in a register and this register shall be kept up to date with monitoring to ensure that NCR's are resolved promptly and the rectification works carried out forthwith. These forms will be used as shown in the following flowchart.



6.0 Work Activity Documentation Requirements

6.1 Excavation

- Safety Certificate
- Approved Drawings

RFA
- Method Statement

ATP
- Test results if excavating unsuitable
- Inspection Checklist (completed by Engineer inspector)

RFS
- Survey report of excavated levels

6.2 Embankment

- Safety Certificate
- Approved Drawings

Each layer

RFA
- Source approval and compliance of material (i.e. borrow area approval with supporting testing)
- Method Statement

ATP
- Inspection checklist (completed by Engineer inspector)

RFT
- Field density results
- Material compliance (gradations, plastic index, CBR, etc.)

RFS (sub-grade layer only)
- Survey report (geometric tolerances)

6.3 Sub-Base & Aggregate Base

- Safety Certificate
- Approved Drawings

RFA
- Mix design approval
- Source approval and compliance of aggregate course
- Method Statement

ATP
- Inspection Checklist (completed by Engineer inspector)
- Site Measurement sheet (completed jointly by Engineer and Contractor)

RFT
- Field density results
- Material compliance (gradations, plastic index, CBR, etc.)

RFS
- Survey report (geometric tolerances)

6.4 Prime & Tack Coat

- Safety Certificate
- Approved Drawings

RFA
- Source approval and compliance of bitumen
- Method Statement

ATP
- Inspection Checklist (completed by Engineer inspector)
- Site Measurement sheet (completed jointly by Engineer and Contractor)

RFT
- Rate of application
- Material compliance (bitumen and blend testing)

6.5 Double Bituminous Surface Treatment (DBST)

- Safety Certificate
- Approved Drawings

RFA
- Source approval and compliance of asphalt binder
- Source approval and compliance of aggregate
- Method Statement

ATP
- Inspection Checklist (completed by Engineer inspector)
- Site Measurement sheet (completed jointly by Engineer and Contractor)

RFT
- Prime coat application rates
- Asphalt binder application rates
- Aggregate spread rates
- Gradations of aggregates

6.6 Asphalt Courses

- Safety Certificate
- Approved Drawings

RFA
- Job mix formula approval
- Source material approval and compliance
- Method Statement

ATP
- Inspection Checklist (completed by Engineer inspector)
- Site Measurement sheet (completed jointly by Engineer and Contractor)

RFT
- Materials compliance (i.e. gradations, AC content, voids, etc.)
- Coring

RFS
- Survey report (geometric tolerances)

6.7 Box Culverts

- Safety Certificate
- Approved Drawings

RFA
- Source material approval and compliance
- Concrete mix design approval
- Method Statement

ATP
- Inspection Checklist (completed by Engineer inspector)
- Site Measurement sheet (completed jointly by Engineer and Contractor)

RFT
- Compressive strength testing
- Material compliance testing

RFS
- Survey report (finished invert levels)

6.8 Stone Masonry

- Safety Certificate
- Approved Drawings

RFA
- Source material approval and compliance (stone, cement and sand)
- Method Statement

ATP
- Inspection Checklist (completed by Engineer inspector)
- Site Measurement sheet (completed jointly by Engineer and Contractor)

RFT
- Mortar compressive strength testing

6.9 Concrete Pipes

- Safety Certificate
- Approved Drawings

RFA

- Source approval and compliance of pipes (supported by testing where applicable)
- Method Statement

ATP

- Inspection Checklist (completed by Engineer inspector)
- Site Measurement sheet (completed jointly by Engineer and Contractor)

RFT

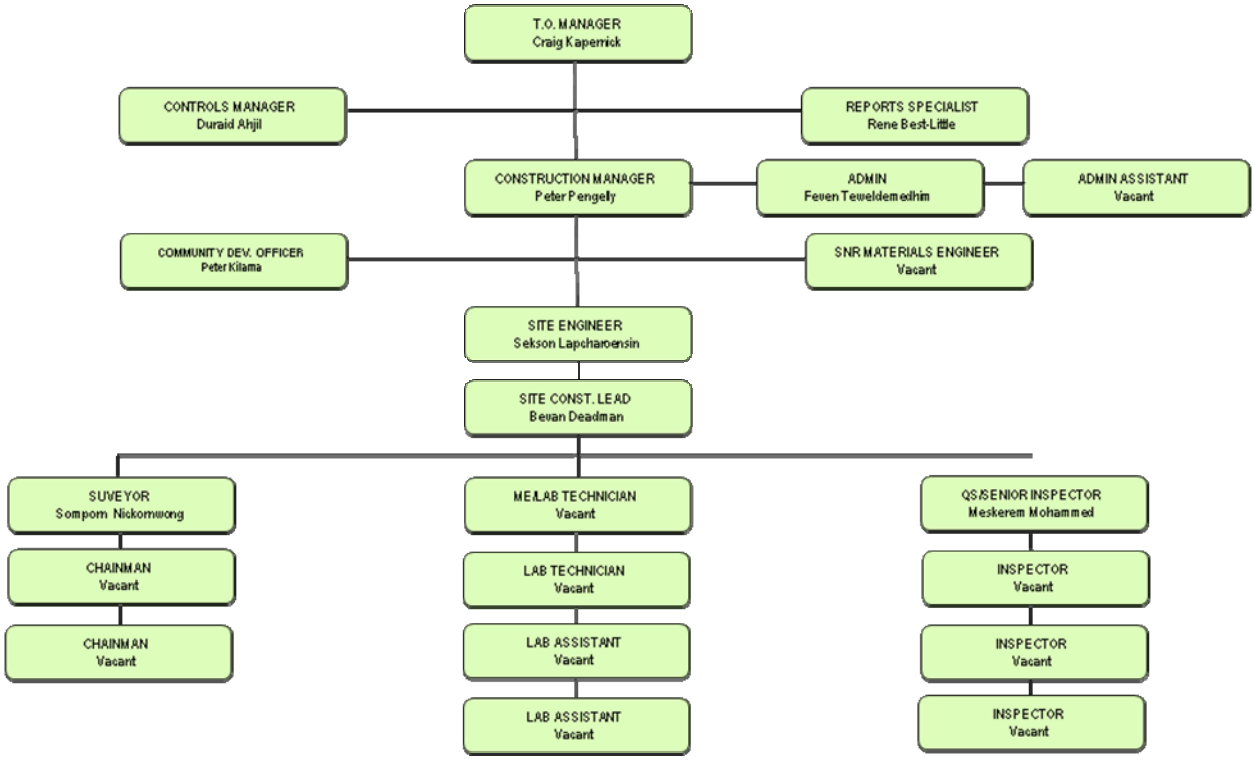
- Joints testing
- Backfill gradation testing

RFS

- Survey report (grade check)

7.0 Project Organizational Structure

7.1 Project Organizational Chart



7.2 Responsibility, Duty and Authority of Project Personnel

7.2.1 TO Manager

The TO Manager has the overall responsibility of delivering the project to the Employer. The scheduling, budget and engineering control are all the responsibility of the TO Manager. He is the Engineer's delegate on-site and will remain the point of contact for the Contractor on all project related matters.

He will have a duty to ensure all records are kept in a format which will be understandable to auditors, stakeholders and other parties involved in the project. The TO Manager has a duty to guarantee that accountability for the budget and quality is maintained.

The TO Manager has the authority to approve and reject conforming and non-conforming work. The TO Manager can instruct the Contractor to complete works which do not have an impact on increasing the overall contract value. However, any works which will increase the contract value must be approved by the Employer.

7.2.2 Construction Manager

The Construction Manager has the responsibility of ensuring the Project Engineers administer the quality system and compliance of quality within the Project through a regime of monitoring and auditing. The Construction Manager is directly responsible to the Task Order Manager. The direct subordinates of the Construction Manager are the Project Engineer and the Senior Materials Engineer. The Construction Manager will keep the Task Order Manager informed on any technical queries, progress, quality or any other pertinent details which the Task Order Manager deems necessary. A thorough knowledge of the technical specifications is required by the Construction Manager.

He will have a duty to ensure that an auditing plan is developed and followed. He is to ensure that the Project Engineer keeps all records in a format which will be understandable to auditors, stakeholders and other parties involved in the Project.

The Construction Manager has the authority to approve and reject conforming and non-conforming work. The Construction Manager can instruct the Contractor to complete works which do not have an impact on increasing the overall Contract value.

7.2.3 Project Engineer

The Project Engineer has the responsibility of administering the quality system used on the project. He must also be able to answer any technical queries which the Contractor may raise. The Project Engineer is directly responsible to the Construction Manager. The direct sub-ordinates of the Project Engineer are the Materials Engineer, Surveyor and Site Inspectors. The Project Engineer will keep the TO and Construction Managers informed on any technical queries, progress, quality or any other pertinent details which the TO Manager deems necessary. A thorough knowledge of the technical specifications is required by the Project Engineer.

The Project Engineer has the authority to approve works and disapprove works proposed or completed by the Contractor. Also, the Project Engineer can issue Site Instructions to the Contractor as required, provided it is not anticipated that the Site Instruction will increase the contract value.

7.2.4 Construction Lead

The Site Construction Lead has the responsibility of supervising the works being carried out on the project by the Contractor. He must also be able to answer any technical queries which the Contractor may raise with regards to the performance of works onsite. The Site Construction Lead is directly responsible to the TO Manager. The direct sub-ordinates of the Site Construction Lead are the Materials Engineer, Surveyor and Site Inspectors. The Site Construction Lead will keep the Construction Manager informed on any technical queries, progress, quality or any other pertinent details which the Construction Manager deems necessary. A thorough knowledge of the technical specifications is required by the Site Construction Lead.

The Site Construction Lead has the authority to approve works and disapprove works proposed or completed by the Contractor. Also, the Site Construction Lead can issue Site Instructions to the Contractor as required, provided it is not anticipated that the Site Instruction will increase the contract value.

7.2.5 Materials Engineer

The Materials Engineer reports to the Project Engineer on matters relevant to the material quality of the project. He will be responsible for supervising the sampling and testing procedures carried out by the Contractor. The Materials Engineer will have laboratory inspectors working for him to assist in the control of quality on the project.

It is the duty of the Materials Engineer to inform the Project Engineer of any works which are non-conforming. The Materials Engineer cannot approve, disapprove, issue Site Instructions to the Contractor or stop any of the works. He can however make recommendations to the Project Engineer, who has the authority to take further action.

7.2.6 Surveyor

The geometric control of the project is the responsibility of the Surveyor. He will ensure that the project meets the geometric tolerances stated in the contract. The Surveyor will have Survey Inspectors to assist him in controlling the geometric quality of the project. The conformance of survey procedures and designs to the contract will be the responsibility of the Surveyor. He may be asked to perform such other tasks required by the Construction Manager or Project Engineer in relation to quantities or other such work as directed by the Construction Manager/Engineer.

It is his responsibility to inform the Project Engineer of any geometric non-conformances and to recommend to the Project Engineer the action required to be taken. The Surveyor cannot approve, disapprove, issue Site Instructions to the Contractor or stop any of the works. He can however make recommendations to the Project Engineer, who has the authority to take further action.

7.2.7 Inspectors

The Inspectors, including Site and Laboratory Inspectors have a monitoring role of works and procedures. The Inspectors have a responsibility to report any non-conformances or activities significant to their superiors. This may include forecasting potential problems of the project which may have a schedule and/ or budget impact. They cannot approve, disapprove, issue Site Instructions to the Contractor or stop any of the works. They can however check the works and make recommendations to their supervisors for further action.

7.2.8 Administration Assistant

The Administration Assistant shall serve as the document controller of the Engineer. Any documents or submissions which the Contractor submits will be submitted to the Administration Assistant. It is his duty to disseminate the documents to the correct person(s) within the Engineer's organization. It is his responsibility to update and maintain the registers required to control the documents and submissions to and from the Contractor. The Administration Assistant is also responsible for facilitating the forms required internally by the Engineer to request any goods or supplies necessary for the project.

The Administration Assistant has no authority within the project organization, except for signing "Received" on documents transmitted by the Contractor or any authority which the TO Manager may delegate in writing.

8.0 Document Control

8.1 Presentation and Control of Documents

Documents are to be presented as per the Conditions of Contract. Certain pertinent details are required to be displayed on the cover page including date submitted, contract number, contractor's name and description of the document. Where applicable, revision numbers are required to be shown on the document or submission.

Testing records are to include a sequential numbering system which can be used to identify test results for each material (to be explained in 8.2 Coding of Documents).

8.2 Coding of Documents

Activity	ATP	RFT	RFS
Roadworks			
Excavation	ATP-EXC-001	RFT-EXC-001	RFS-EXC-001
Embankment	ATP-EMB-001	RFT-EMB-001	RFS-EMB-001
Sub-Grade	ATP-SUG-001	RFT-SUG-001	RFS-SUG-001
Sub-Base	ATP-SUB-001	RFT-SUB-001	RFS-SUB-001
Base Course	ATP-ABC-001	RFT-ABC-001	RFS-ABC-001
Prime Coat	ATP-PCO-001	RFT-PCO-001	RFS-PCO-001
ATB	ATP-ATB-001	RFT-ATB-001	RFS-ATB-001
First Tack Coat	ATP-TC1-001	RFT-TC1-001	RFS-TC1-001
Binder Course	ATP-BIN-001	RFT-BIN-001	RFS-BIN-001
Second Tack Coat	ATP-TC2-001	RFT-TC2-001	RFS-TC2-001
Wearing Course	ATP-AWC-001	RFT-AWC-001	RFS-AWC-001
DBST 1st Layer	ATP-DB1-001	RFT-DB1-001	RFS-DB1-001
DBST 2nd Layer	ATP-DB2-001	RFT-DB2-001	RFS-TAC-001
Culvert Structures			
Culvert Excavation	ATP-CUE-001	RFT-CUE-001	RFS-CUE-001
Culvert Installation RCP	ATP-CIP-001	RFT-CIP-001	RFS-CIP-001
Culvert Installation RCBC	ATP-CIB-001	RFT-CIB-001	RFS-CIB-001
Culvert Installation STM	ATP-CSM-001	RFT-CSM-001	RFS-CSM-001
Culvert Insitu Setup	ATP-CIS-001	RFT-CIS-001	RFS-CIS-001
Culvert Insitu Concrete	ATP-CIC-001	RFT-CIC-001	RFS-CIC-001
Culvert Backfill	ATP-CUB-001	RFT-CUB-001	RFS-CUB-001
Other Drainage			
Drainage Excavation	ATP-DRA-001	RFT-DRA-001	RFS-DRA-001
Slope Reinforcement	ATP-SLR-001	RFT-SLR-001	RFS-SLR-001
Stone Masonry Wall	ATP-STM-001	RFT-STM-001	RFS-STM-001
Other Concrete	ATP-CON-001	RFT-CON-001	RFS-CON-001

Road Furniture etc			
Kerbing	ATP-KER-001	RFT-KER-001	RFS-KER-001
Linemarking	ATP-RLM-001	RFT-RLM-001	RFS-RLM-001
Road Signs	ATP-RSI-001	RFT-RSI-001	RFS-RSI-001
Street Lighting Installation	ATP-SLI-001	RFT-SLI-001	RFS-SLI-001

Activity	**RFA**
Documents (TMP, EMP, etc)	ATP-DOC-001
Method Statement	ATP-MST-001
Mix Design	ATP-MXD-001
Source Approval, Material Approvals	ATP-QCD-001
Equipment Calibration	ATP-CAL-001

9.0 Control of Non-Conforming Product

Non-conforming work will not be allowed to remain incorporated into the works. Neither will non-conforming works be certified for payment. Effective rectification works shall be carried out prior to this work being accepted and payment made. Rectification works shall depend on the nature and severity of the non-conformance.

All instances of non-conforming works shall be documented by the use of the NCR. It is the responsibility of the Project Engineer and Construction Manager to ensure that non-conforming product is isolated and not incorporated into the works.

10.0 Audit of Quality Assurance System and Plan

This Quality Assurance System and QAP shall be audited at frequent intervals by the TO Manager. Based on the results of these audits, changes or revisions may be made to the system and these changes reflected in revisions to this plan.

It is the responsibility of all personnel to highlight any inconsistencies or inadequacies of this system to the TO Manger in order to improve this system.

11.0 Appendices

11.1 Appendix A - Requisition Forms

11.2 Appendix B - Audit Requisition Forms

11.3 Appendix C - Inspection Test Plans & Inspection Checklists

11.4 Appendix D - Site Measurement Form

11.5 Appendix E - Site Instruction Form

11.6 Appendix F - Non-Conformance Report

11.7 Appendix G - Work Progress Chart/Summary Chart

11.8 Appendix H - Procedures

Appendix A

Requisition Forms

APPROVAL TO PROCEED

Engineer : The Louis Berger Group, Inc.
Contract Number :
Project Name :

Contractor :
Reference : ATP -
Date Submitted :

Approval to Proceed for :

☐ Excavation ☐ Embankment(Layer ___) ☐ Sub-Grade Layer ☐ Subbase (Layer__)
☐ Base Course (Layer ___) ☐ Prime Coat ☐ ATB ☐ Tack Coat
☐ Wearing Course ☐ Binder Course ☐ 1st Layer DBST ☐ 2nd Layer DBST

☐ Culvert Excavation ☐ Culvert Installation RCP ☐ Culvert Installation RCBC (precast units)
☐ Culvert Instal Stone Pitch ☐ Culvert Insitu Setup ☐ Culvert Insitu Concrete pour (Stage_____)
☐ Culvert Backfill

☐ Kerb ☐ Road Funiture ☐ Linemarking ☐ Other (State) _____

Location : KM TO KM ☐ LHS ☐ RHS ☐ Both

Contractor's Comments/Description:

I hereby certify that the underlying layers and all testing,approvals and documentation required has been carried out to the satisfactionj of the Contract.

Submitted by (Contractor) : _____ Date : _____ (day/month/year)
I hereby certify that the underlying layers and all testing,approvals and documentation required has been carried out to the satisfactionj of the Contract.

Received by (LBG) : _____ Date : _____ (day/month/year)

Underlying Layer/Preparation Works	CONTRACTOR		LBG	Underlying Layer/Preparation Works	CONTRACTOR		LBG
(Checklist Items)	Reference Document	Name / Signature	Acceptable/ Not Acceptable	(Checklist Items)	Reference Document	Name / Signature	Acceptable/ Not Acceptable
1. Work Area Demined (Cert. No.)				7. Underlying Layer Survey conformance (Level/Alignment)			
2. Approved Drawings (Drwg No.)				-	RFS -		
				-	RFS -		
3. Method Statement	RFA-			-	RFS -		
4. Mix Design (if applicable)	RFA-			8. Inspection of underling layer complete			
5. Traffic Control Plan				-	ITS-		
	RFA-			-	ITS-		
	RFA-			-	ITS-		
6. Underlying Layer Material Conformance				9. Source Approval/Mat'l Compliance of Mat'l to be used			
-	RFT -			-	RFA-		
-	RFT -			-	RFA-		
-	RFT -			-	RFA-		
-	RFT -						

Remarks:

Certified by :
I hereby certify that the underlying layers and all testing,approvals and documentation required has been carried out to the satisfactionj of the Contract.

☐ Approved to Proceed

☐ Approved to Proceed w/ Condition(s)
(Specify)

☐ Not Granted, Remedial Works Required

_____ ____/_____/_____
Proj. Manager/Proj. Engineer/Proj. Supervisor Date

ENGINEER'S COMMENTS :

Form ATP-01

Request For Approval
(RFA)

Engineer : Louis Berger Group
Contract Number :
Project Name :

Contractor :
Reference : RFA -
Date submitted:

Request for Approval for the following works

- ☐ Documents
- ☐ Source approval
- ☐ Equipment calibration
- ☐ Method Statement
- ☐ Material approval
- ☐ Plant calibration
- ☐ Mix Design
- ☐
- ☐

LBG Materials Engineer to attach report of findings

Contractor's Comments/Description :

Submitted by : _____ Date : _____ (day/month/year)
(Contractor)

Received by : _____ Date : _____ (day/month/year)
(LBG)

Engineer's Comments:

☐ Approved ☐ Rejected, Re-submit

Checked by : _____ Date : _____ (day/month/year)
(LBG)

Approved by : _____ Date : _____ (day/month/year)
(LBG)

Request For Survey
(RFS)

Engineer: Louis Berger Group
Contractor:
Contract Number:
Reference: RFS- -
Project Name:
Date Submitted:

Request for Survey for the following works:

- ☐ General
- ☐ Sub-Grade
- ☐ Sub-Base
- ☐ Base Coarse
- ☐ Binder Course
- ☐ Wearing Course
- ☐ Structures
- ☐ Drainage
- ☐ O.G.L.

Type of Survey Check:

- ☐ Dimensional Tolerance
- ☐ Benchmark & Stations
- ☐ Alignment
- ☐ Topographic pick-up

Chainage from	Chainage to	Left/Right Lane or Road width

Which will be ready on; **Date:**
Time:

Contractor's Comments/Description:

Submitted by: _____ Date: _____ (day/month/year)
(Contractor)

Received by: _____ Date: _____ (day/month/year)
(LBG)

Head Contractor Survey Engineer's Comments/Recommendations:

Engineer's Comments:

☐ Approved ☐ Not Approved, Re-submit

Checked by: _____ Date: _____ (day/month/year
(LBG)

Approved by: _____ Date: _____ (day/month/year)
(LBG)

Request For Testing
(RFT)

Engineer: Louis Berger Group
Contractor:
Contract Number:
Reference: RFT- -
Project Name:
Date Submitted:

Request for Testing for the following works:

- ☐ Borrow Pit
- ☐ OGL classification
- ☐ Embankment (Layer…)
- ☐ Sub-Grade (Layer…)
- ☐ Sub-Base (Layer…)
- ☐ Base Coarse (Layer…)
- ☐ Prime Coat
- ☐ ATB
- ☐ Tack Coat 1
- ☐ Binder Course
- ☐ Tack Coat 2
- ☐ Wearing Course
- ☐ DBST 19mm
- ☐ DBST 10mm
- ☐ Culvert Base
- ☐ Culvert Concrete
- ☐ Culvert Backfill
- ☐ Drainage
- ☐ Other Concrete
- ☐ ……..

Type of Test:

Location: km TO km

This will be ready on; **Date:**
Time:

Contractor's Comments/Description:

Submitted by: _____ Date: _____ (day/month/year)
(Contractor)

Received by: _____ Date: _____ (day/month/year)
(LBG)

Head Contractor Material Engineer's Comments/Recommendations:

Engineer's Comments:

☐ Approved ☐ Not Approved, Re-submit

Checked by (LBG):_____ Date: _____ (day/month/year

Certified by (LBG):_____ Date: _____ (day/month/year)

Appendix B

Audit Requisition Forms

Request For Audit Surveying
(RFAS)

Engineer: Louis Berger Group
Contractor:
Contract Number:
Reference: RFAS- -
Project Name:
Date Requested:

Request for Survey for the following works:

- ☐ General
- ☐ Sub-Grade
- ☐ Sub-Base
- ☐ Base Coarse
- ☐ Binder Course
- ☐ Wearing Course
- ☐ Structures
- ☐ Drainage
- ☐ O.G.L.

Type of Survey Check:

- ☐ Dimensional Tolerance
- ☐ Benchmark & Stations
- ☐ Alignment
- ☐ Topographic pick-up

Volume/Area/Length Checked:
No. points:

Chainage from	Chainage to

Requested by: _____ Date: _____ (day/month/year)
(LBG)

Received by: _____ Date: _____ (day/month/year)
(LBG)

Survey Engineer's Comments/Recommendations:

_____

Engineer's Comments:

☐ Approved ☐ Not Approved, Re-submit

Checked by: _____ Date: _____ (day/month/year
(LBG)
Approved by: _____ Date: _____ (day/month/year)
(LBG)

Request For Audit Testing
(RFAT)

Engineer: Louis Berger Group
Contractor:
Contract Number:
Reference: RFAT- -
Project Name:
Date Requested:

Request for Audit Testing for the following works:

- ☐ Borrow Pit
- ☐ OGL classification
- ☐ Embankment (Layer…)
- ☐ Sub-Grade (Layer…)
- ☐ Sub-Base (Layer…)
- ☐ Base Coarse (Layer…)
- ☐ Prime Coat
- ☐ ATB
- ☐ Tack Coat 1
- ☐ Binder Course
- ☐ Tack Coat 2
- ☐ Wearing Course
- ☐ DBST 19mm
- ☐ DBST 10mm
- ☐ Culvert Base
- ☐ Culvert Concrete
- ☐ Culvert Backfill
- ☐ Drainage
- ☐ Other Concrete
- ☐ ……..

Type of Test:

Location: km TO km

Test Frequency: 1 per Volume/Area/Weight Tested: No. tests:

Chainage	Offset (m)

Requested by (LBG): _____ Date: _____ (day/month/year)

Received by (LBG): _____ Date: _____ (day/month/year)

Material Engineer's Comments/Recommendations:

Engineer's Comments:

☐ Approved by: ☐ Not Approved

Checked by (LBG): _____ Date: _____ (day/month/year

Approved by (LBG): _____ Date: _____ (day/month/year)

Request For Joint Audit Surveying
(RFJAS)

Engineer: Louis Berger Group
Contractor:
Contract Number:
Reference: RFJAS- -
Project Name:
Date Requested:

Request for Survey for the following works:

- ☐ General
- ☐ Base Coarse
- ☐ Structures
- ☐ Sub-Grade
- ☐ Binder Course
- ☐ Drainage
- ☐ Sub-Base
- ☐ Wearing Course
- ☐ O.G.L.

Type of Survey Check:

- ☐ Dimensional Tolerance
- ☐ Alignment
- ☐ Benchmark & Stations
- ☐ Topographic pick-up

Volume/Area/Length Checked:
No. points:

Chainage from	Chainage to

Requested by (LBG): _____ Date: _____ (day/month/year)

Received by (LBG): _____ Date: _____ (day/month/year)

Received by (Contractor): _____ Date: _____ (day/month/year)

Survey Engineer's Comments/Recommendations:

Engineer's Comments:

☐ Approved ☐ Not Approved, Re-submit

Checked by (LBG): _____ Date: _____ (day/month/year

Approved by (LBG):_____ Date: _____ (day/month/year)

Request For Joint Audit Testing
(RFJAT)

Engineer: Louis Berger Group
Contractor:
Contract Number:
Reference: RFJAT- -
Project Name:
Date Requested:

Request for Audit Testing for the following works:

- ☐ Borrow Pit
- ☐ OGL classification
- ☐ Embankment (Layer…)
- ☐ Sub-Grade (Layer…)
- ☐ Sub-Base (Layer…)
- ☐ Base Coarse (Layer…)
- ☐ Prime Coat
- ☐ ATB
- ☐ Tack Coat 1
- ☐ Binder Course
- ☐ Tack Coat 2
- ☐ Wearing Course
- ☐ DBST 19mm
- ☐ DBST 10mm
- ☐ Culvert Base
- ☐ Culvert Concrete
- ☐ Culvert Backfill
- ☐ Drainage
- ☐ Other Concrete
- ☐ ……..

Type of Test:

Location: km TO km

Test Frequency: 1 per Volume/Area/Weight Tested: No. tests:

Chainage	Offset (m)

Requested by (LBG) : _____ Date: _____ (day/month/year)

Received by (LBG):_____ Date: _____ (day/month/year)

Received by (Contractor):_____ Date: _____ (day/month/year)

Material Engineer's Comments/Recommendations:

_____

Engineer's Comments:

☐ Approved by: ☐ Not Approved

Checked by (LBG):_____ Date: _____ (day/month/year

Approved by (LBG): _____ Date: _____ (day/month/year)

Appendix C

Inspection Test Plans
&
Inspection Checklists

Inspection & Test Plan
FOUNDATION PREPARATION FOR EMBANKMENT

Engineer: Louis Berger Group
Contract Number:
Project Name:

Contractor:
Date Submitted:
Reference: ITP-FDP-001

	S/N	Operation or Stage of Work	Stage/Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
								Contractor	Engineer
ATP Requirements	1	Pre-requisite Approvals acquired	Before commencement of embankment foundation preparation	De-mining certificate, Work Method Statement	Job requirement	All clearances received for commencement of work.	Documents to be submitted to Engineer for approval	H	H
	2	Classification Testing of existing Ground	Before commencement of embankment foundation preparation	RFT, lab reports	Section 4103	Approved report	Engineers Review	H	H
	3	Survey of existing ground	Before commencement of embankment foundation preparation	RFS, Survey reports & ITS	Section 4103	Approved RFS & ITS	Submit RFS to Engineer for approval	H	H
Construction Requirements	4	Remove and conserve Topsoil	During foundation preparation	ITS	Section 4103(a)	Topsoil Removed and placed in Windrows/stockpiles	Visual Check	X	W
	5	Shaping and compaction of the Roadbed on suitable material	During foundation preparation	ITS	Section 4102(b)	Minimum compaction not less than 95% MDD	Visual Check	X	W
	6	If embankment on existing slope > 1:3 Benching to be cut on slope	During foundation preparation	ITS	Section 4405(f)	Benches sufficient width for machinery operations	Visual Check	X	W
	7	Tyning and rolling of Natural Surface	During foundation preparation	ITS	Section 4102(b)	Scarify to a Minimum Depth 150 mm	Visual Check	X	W
Completion requirements	8	Compaction of Natural Surface	3 tests per 1000m^2	RFT, lab reports	Section 4102(b)	MDD >95%	AASHTO T 180 AASHTO T 191 AASHTO T 205	X	W
	9	Pre-Handover	After embankment completed	ATP, RFA, RFS, ITS & RFT	Section 4101	All Requests and checklists completed and signed	Review	H	H

H - Hold Point W - Witness Point X - Self-Inspection

Inspection & Test Plan
EMBANKMENT

Engineer: Louis Berger Group
Contract Number:
Project Name:

Contractor:
Date Submitted:
Reference: ITP-EMB-001

	S/N	Operation or Stage of Work	Stage/Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
								Contractor	Engineer
ATP Requirements	1	Approval of underlying layer	Before commencement of embankment	RFT, ITS, RFS of underlying layer	Job requirement	Underlying layer conforms to specs. Division 4100	Documents to be submitted to Engineer for approval	H	H
	2	Pre-requisite approvals acquired	Before commencement of embankment	RFA Source approval, Method Statements	Job requirement	Source approval and Method Statement meets Engineer's approval	Engineer's Review	H	H
	3	Source/Compliance testing of general fill	Before commencement of embankment layer. 1 per 5000m^3 or change of source.	RFT, lab reports & ITS	Section 4402	Embankment should not contain Particles with a maximum dimension Exceeding two-thirds of the specified thickness. LL = 60 max. PI = 30 max. CBR@95% = 4min. ; swell =1.5 max.	Gradation – AASHTO T88 PI - AASHTO T 90 MDD - AASHTO T180 CBR – AASHTO T193	H	H
Construction Requirements	4	Material to be free of oversize and foreign matter	During embankment construction	ITS	Section 4402©	Embankment should not contain Particles with a maximum dimension Exceeding two-thirds of the specified thickness. LL = 60 max. PI = 30 max. CBR@95% = 4min. ; swell =1.5 max.	Gradation – AASHTO T88 PI - AASHTO T 90 MDD - AASHTO T180 CBR – AASHTO T193	X	W
	5	Thickness of embankment layers	During embankment construction	ITS	Section 4405(b)	max 200mm	Visual check	X	W
	6	Moisture Control	During embankment construction	ITS	Section 4405(e)	± 2% OMC	Site measurement	X	W
	7	Finishing of Slopes	During embankment construction	ITS	Section 4504	Slopes smooth and uniform to ensure free draining.	Visual check and Site measurement	X	W
Completion Requirements	8	Compaction of embankment layers	3 tests per 1000m^2	RFT, lab reports & ITS	Section 4405(e)	Not less than 95% of the MDD	AASHTO T 180 AASHTO T 191 AASHTO T 205	X	W
	9	Geometric Tolerances	After Layer completed	ITS	Section 4405(b)	Horiz. Slope max. 100mm from design profile.	Visual Check and Measurement	H	H
	10	Pre-Handover	After embankment completed	ATP, RFA, ITS & RFT	Job requirement	All Requests and checklists completed and signed	Review	H	H

Inspection & Test Plan
ROADWORKS EXCAVATION

Engineer: Louis Berger Group
Contract Number:
Project Name:

Contractor:
Date Submitted:
Reference: ITP-EXC-001

	S/N	Operation or Stage of Work	Stage/Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
								Contractor	Engineer
ATP Requirements	1	Pre-requisite Approvals acquired	Before excavation	De-mining certificate, approved design and any other approval requirements	Job requirement	All clearances received for commencement of work.	Documents to Engineer for approval	H	H
	2	Testing of in-situ material to be excavated (for use in Embankment/Backfill)	Before excavation	RFT, Lab reports & ITS	Section 4401 (b) Section 4302 (a) Section 4402 Section 4403	Embankment not contain particles with a maximum dimension exceeding two-thirds of the specified layer thickness after compaction. LL = 60% max. PI = 30 max. CBR (95%) >4% ; swell <1. 5%	Gradation – AASHTO T88 PI - AASHTO T 90, 89 MDD - AASHTO T180, "D" CBR – AASHTO T193	H	W
	3	Classification Testing of existing Ground	Before excavation	RFT, lab reports	Job requirement	Approved report	Engineers Review	H	H
	4	Survey of Existing ground	Before excavation	RFS, Survey reports	Job requirement	Survey Completed	Submit RFS to Engineer for approval	H	H
Construction Requirements	5	Clear area of Vegetation and obstructions	During excavation	ITS	Section 4103(a)	Area cleared of Vegetation and obstructions	Visual Check of Site	X	W
	6	Excavation to design	During excavation	ITS	Job requirement	Correctly excavated	Survey instruments and visual check of excavation to design	X	W
	7	Protection of works	End of each day	ITS	Section 4104	Drains shaped filling in low spot to ensure free draining.	Visual Check of site	X	W
Completion requirements	8	Survey of Excavated ground	After excavation	RFS, Survey Report & ITS	Job requirement	Survey completed	Submit RFS to Engineer for approval.	H	W
	9	Pre-Handover	After excavation	ATP, RFA, RFS, ITS, (& RFT for unsuitable excavation)	Job requirement	All Requests and checklists completed and signed	Review	H	H

H - Hold Point **W - Witness Point** **X - Self-Inspection**

Inspection & Test Plan
SUB-GRADE

Engineer: Louis Berger Group
Contractor:
Contract Number:
Date Submitted:
Project Name:
Reference: ITP-SUG-001

	S/N	Operation or Stage of Work	Stage/Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
								Contractor	Engineer
ATP Requirements	1	Approval of underlying layer (Excavation/Embankment)	Before commencement sub-grade	RFT, ITS, RFS of underlying layer	Section 4401	Underlying layer conforms to specs.	Documents to be submitted to Engineer for approval	H	H
	2	Pre-requisite Approvals	Before commencement of Sub-Grade	RFA Source approval, and Method Statement	Section 4401	Source approval and Method Statement meets Engineer's approval.	Engineer's review	H	H
	3	Source testing of general fill	Before commencement of Sub-Grade 1 per 5000m3 or change of source.	RFT, lab reports & ITS	Section 4402 Section 4302(a) Table 4400/1	Particle size not exceeding two-thirds of the specified layer thickness after compaction. LL=60 max. PI =30 max. CBR (95%) =4% min; Swell = 1.5% max.	Gradation – AASHTO T27 PI - AASHTO T 90 MDD - AASHTO T180 CBR – AASHTO T193 Free of Foreign material	H	W
Construction Requirements	4	Embankment - Thickness of Subgrade layer	During subgrade construction	ITS	Section 4405(e)	Compacted layer thickness 200mm Max.	Visual check AASHTO T180	X	W
	5	In Cut section –Failed density has to be scarified (150mm), watered and compact. Rocky area provide a levelling course subgrade material	During subgrade construction	RFT & ITS	Section 4103(c)	Tyne and compact 150mm Min 95% MDD	Visual Check AASHTO T180	W	W
	6	Moisture Control	During subgrade construction	ITS	Section 4405(e)	± 2% OMC	Site measurement	X	W
Completion requirements	7	Compaction of Subgrade layers	5 tests per 2000m^2	RFT, lab reports & ITS	Section 4405(e)	min 95% MDD	AASHTO T 180, T 191, T205	X	W
	8	Survey of Subgrade top	After Sub-grade completed	RFS, Survey Report	Section 4208(i)	Design variance - +10/-50mm	Submit RFS to Engineer for approval.	H	W
	9	Proof Rolling	Completion of subgrade layer	ITS	Job requirement	No vertical movement	Visual Inspection	H	H
	10	Pre-Handover	After Sub-grade completed	ATP, RFA, RFS, ITS & RFT	Job requirement	All Requests and checklists completed and signed	Review	H	H

H - Hold Point **W - Witness Point** **X - Self-Inspection**

Inspection & Test Plan
STABILIZED SUB-BASE

Engineer: Louis Berger Group
Contractor:
Contract Number:
Date Submitted:
Project Name:
Reference: ITP-SUB-001

	S/N	Operation or Stage of Work	Stage/Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
								Contractor	Engineer
ATP Requirements	1	Approval of underlying layer	Before commencement of stabilized sub-base	RFT, ITS & RFS of underlying layer	Section 5102	Underlying layer conforms to specs.	Documents to be submitted to Engineer for approval	H	H
	2	Pre-requisite approvals	Before commencement of stabilized sub-base	RFA Mix Design Source approvals and Method Statement	Section 5103 Section 4602(a) Section 4603(e)	Mix Design, Source approvals and Method Statement meets Engineer's approval	Engineer's Review	H	H
	3	Source testing of aggregate base	3 test per type and source of material	RFT, lab reports	Section 5104 Section 4602(b)(ii) Table 5104/1 "C"	Gradation - Table 5104/1 "C" PI = 6 to 12, PP = 75 max. Abrasion = 51% Max CBR = 30% min. MDD-95% of Compaction $\pm$- 2% OMC	AASHTO T 88, M 145, T 90, T 89, T 180, T 193, T 96, T 191, T 310, M 216	H	W
	4	Trial section	1000m^2	ATP, ITS	Section 5107 ©	No segregation FDT=95% min.		H	W
Construction Requirements	4	Compliance testing of sub-base (Production)	PI - 1 per 5000 m^3 Grad. – 1 per 5000 m^3 MDD - 1 per 3000m^3 CBR - 1 per 5000m^3	RFT, lab reports & ITS	Section 5104	PI = 6 to 12 Grad. - Table 5104/1 "C" Abrasion = 51% max CBR - min. 30%	AASHTO T 90, T 89, T 193, T 180 D, T 145, T 88, M85	X	W
	5	Thickness of sub-base layers	During sub-base placement	ITS & survey data	Section 5104	Max 200mm Min 100mm	Visual & survey data	X	W
	6	Moisture Control	During Sub-base placement	ITS	Section 5107(a)	$\pm$2% OMC	Site measurement	X	W
	7	Compliance testing of in-situ sub-base	4 test per 2510m^2	RFT	Section 5112/1	FDT / OMC = 95% min. Grad. - Table 5112/1 PI = 6 to 12	AASHTO, T 90, T 89	X	W
	8	Straight edge requirements	During sub-base placement	RFS, Survey Report & ITS	Section 5110(d)	3m straightedge > 20 mm	Site Measurement	H	W
Completion Requirements	9	Compaction of sub-base layers	5 tests per 2000m^3	RFT, lab reports & ITS	Section 5104(f)	MDD - min. 95%	AASHTO T 180 D, T 193	X	W
	10	Survey top of sub-base	After aggregate sub-base completed	RFS, Survey Report & ITS	Section 5111	Design variance $\pm$25mm Crossfall - $\pm$/0.2% Grade variance - +/-0.1%	Submit RFS to Engineer for approval.	H	W
	11	Protection and Maintenance	Prior to Base Layer	ITS	Section 5108	No vertical movement	Visual Inspection	H	H
	12	Pre-Handover	After sub-base completed	ATP, RFA, RFS, ITS & RFT	Job requirement	All Requests and checklists completed and signed	Review	H	H

H - Hold Point **W - Witness Point** **X - Self-Inspection**

Inspection & Test Plan
STABILIZED AGGREGATE BASE

Engineer: Louis Berger Group
Contractor:
Contract Number:
Date Submitted:
Project Name:
Reference: ITP-ABC-001

	S/N	Operation or Stage of Work	Stage/Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
								Contractor	Engineer
ATP Requirements	1	Approval of underlying layer	Before commencement of aggregate base	RFS, ITS & RFT of underlying layer	Section 5201	Underlying layer conforms to specs.	Documents to be submitted to Engineer for approval	H	H
	2	Pre-requisite approvals	Before commencement of aggregate base	RFA Mix Design and Method Statement	Section 5205	Mix Design and Method Statement meets Engineer's approval	Engineer's Review	H	H
		Source testing of aggregate base	3 test per type and source of material	RFT, lab reports	Section 5203 Section 5204 Table 5200/3	Gradation - Table 5200/3 PI 6 Max, PP– max 60, Abrasion – 45% Max CBR – Min 80% , ACV (TFV) –50 KN min. Crushed Ratio – 60% min. Flakiness – 30% , FDT- Min 98% , ± 2% OMC	AASHTO T 27, T 11, T 90, ASTM D 1577, BS 812, Part 110, 105	H	W
	3	Trial Sections	1000m^2 minimum	ATP, ITS	5209 (d)	No segregation FDT- Min 98% , ± 2% OMC		H	W
Construction requirements	4	Compliance testing of aggregate base (production)	PI - 1 per 5000 m^3 Grad. – 1 per 5000 m^3 MDD - 1 per 3000m^3 CBR - 1 per 5000m^3	RFT, lab reports & ITS	Section 5204(c) Section 5204(d)	Gradation - Table 5200/3 PI 6 Max, PP– max 60, Abrasion – 45% Max CBR – Min 80% , ACV (TFV) –50 KN min. Crushed Ratio – 60% min. Flakiness – 30% ,	AASHTO T 27, T 11, T 90, ASTM D 1577, BS 812, Part 110, 105	X	W
	5	Thickness of aggregate base layers	During base placement	ITS & survey data	Section 5204(d)	Max 200mm Min 100mm	Visual & survey data	X	W
	6.	Moisture Control	During base placement	ITS	Section 5204	± 2% OMC	Site measurement	X	W
	7.	Compliance testing of in-situ aggregate base	1 test per 500m	RFT	Section 5204(a)	PI 6 Max Grad. - Table 5104/1	AASHTO, T 90, T 89	X	W
Completion requirements	8	Compaction of aggregate base layers	5 tests per 2000m^3	RFT, lab reports & ITS	Section 5204(d)	FDT- Min 98% , ± 2% OMC	AASHTO, T 90, T 89	X	W
	9	Survey top of aggregate base	After aggregate base completed	RFS, Survey Report & ITS	Section 5211(d)	Design variance – ±10mm 3m straightedge > 5mm Crossfall - ±0.2% Grade variance - ±-0.1%	Submit RFS to Engineer for approval.	H	W
	10	Smoothness test	Prior to cleaning for Priming	ITS	Section 5208(b)	No vertical movement	Visual Inspection	H	H
	11	Pre-Handover	After sub-base completed	ATP, RFA, RFS, ITS & RFT	Job requirement	All Requests and checklists completed and signed	Review	H	H

H - Hold Point **W - Witness Point** **X - Self-Inspection**

Inspection & Test Plan
PRIME COAT

Engineer: Louis Berger Group
Contract Number:
Project Name:

Contractor:
Date Submitted:
Reference: ITP-PCO-001

	S/N	Operation or Stage of Work	Stage/Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
								Contractor	Engineer
ATP Requirements	1	Approval of underlying layer	Before commencement of prime coat	RFT, RFS & ITS of underlying layer	Job requirement	Underlying layer conforms to specs.	Documents to be submitted to Engineer for approval	H	H
	2	Preliminary approvals	Before commencement of prime coat	RFA Prime design source material & Method Statement	Job requirement	Prime Design, source approvals & Method Statement meets Engineers Approval	Engineer's Review	H	H
	3	Bituminous materials receipt	Viscosity - every alternative delivery received Materials certificate - each delivery received	RFT, lab reports, ITS & manufacturers certificate of the bitumen	Section 6102(a)	Conform to specs. AASHTO M 81, 82 SABS1260	Submit to Engineer sample and certificate for each delivery	H	H
Construction Requirements	4	Weather conditions	Before application	ITS	Section 6105	Not foggy or rainy Temperature above 10° C	Visual Check and Temperature Measurement	H	W
	5	Cleaning of underlying surface / surface preparation	Before application	ITS	Section 6107	No loose material on underlying layer	Visual check	X	W
	6	Application of prime coat	During application	ITS	Section 6108	Even application Correct Spraying Temperature Target spray rate	Visual Check & Temperature Measurement	X	W
	7	Compliance testing of prime coat	1 per 100 Lm	RFT, lab reports	Section 6108 Table 6100/1	Application Cutback - 0.6-1.0 l/m^2 Tolerance – 0.05 l/m^2	Measure volume applied	X	W
Completion requirements	8	Cure of Surface	After application of prime coat	ITS	Table 6100/1	Emulsion – 24 hrs Cutback – 3 days	Visual Check	X	W
	9	Maintenance of surface	After application	ITS	Section 6109	Free of loose material and corrugations	Visual Check	X	W
	10	Application of Blotter (if required)	If required	ITS	Section 6108	Excess blotter swept away	Visual Check & Engineer's Approval	H	H
	11	Pre-Handover	After prime-coat completed	ATP, RFA, RFS, ITS & RFT	Job requirement	All Requests and checklists completed and signed	Review	H	H

H - Hold Point **W - Witness Point** **X - Self-Inspection**

Inspection & Test Plan
DOUBLE BITUMINOUS SURFACE TREATMENT (1ST LAYER – 14mm)

Engineer: Louis Berger Group
Contractor:
Contract Number:
Date Submitted:
Project Name:
Reference: ITP-DB1-001

	S/N	Operation or Stage of Work	Stage/Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
								Contractor	Engineer
ATP Requirements	1	Approval of underlying layer	Before commencement of sealing	RFS, ITS & RFT of underlying layer	Job Requirement	Underlying layer conforms to specs.	Documents to be submitted to Engineer for approval	H	H
	2	Pre-requisite approvals	Before commencement of sealing 7 days prior	RFA Seal Design, Source of supply of Bitumen, Cover Aggregate, and Method Statement	Section 63C02	ALD, Seal Design, Target Rates, Cover Aggregate and Bitumen Source approvals, and Method Statement meets Engineer's approval	Engineer's Review	H	H
	3	Cover Aggregate Source Testing	35kg sample provided 21 days prior to sealing 1 test per 1500 t Gradation 1 per 500t	RFT, Lab Reports	Section 63C02 Section 63A11 Section 63A02(f) Table 6300A/10 Table 6300A/17	Materials shall conformed to Division 6300A ALD as per Table 6300C/1 LAA - max 30% ACV - max 25% Soundness - max 12% Flakiness – 30% max Agg. Dry Strength - min 210KN Wet/Dry Ratio - 75%	AASHTO T89, T96, T104, T112, T210, ASTM D 1139-90, D 4791, D5821, RTA T230, AS1141.20.3	H	H
	4	Cover Aggregate Production Testing	Grading 1-test per 250m^3 LAA – 1 test per 1000m^3 Flakiness- 1test/250m^3 Soundness – 1 test/1000m^3	RFT, Lab Reports	Section 63B03(a) Table 63A19(a)	Grading as per Table 6300A/8	AASHTO T11, T27,	H	H
	5	Pre-coating Aggregate	Min 3 days prior to application of seal	ITS	Section 63A02(f)(i) Section 63B0(f)	Rate 12 litres/m^3 aggregates 90% diesel 10% AC	Visual Check	H	H
Construction Requirements	6	Weather Conditions	Before and During Sealing	ITS	Section 63A04(b)	Ambient Temperature above 15° C Work completed 2 hours before sunset	Visual Check	X	W
	7	Surface Preparation	Prior to Sealing	ITS	Section 63A07(a)	Surface clean of loose deleterious material, water, no defects and Prime Cured	Visual Check	X	W
	8	Bituminous material	Before commencement - 1 per tanker at delivery 2 x 1 litre containers	RFT Lab Reports	Section 63A02(a)	Bitumen AASHTO M20 or M226 Emulsion AASHTO M140 or M208	AASHTO M226	H	H

Inspection & Test Plan
DOUBLE BITUMINOUS SURFACE TREATMENT (1ST LAYER – 14mm)

	8	Addition of Cutter/Flux/Adhesion Agent	Prior to loading Bitumen	ITS	Section 63A12	As ordered by the Engineer, Mixed 700 litres per min for 20 min's before spraying	Visual Check	X	W
	9	Seal Coat (Bitumen application)	During sealing operation	RFT, ITS	Section 63A09	Building paper used at start of each run and nearby objects protected from splattering Spray evenly applied Application +/- 5% Target Rate Temperature per bitumen type 150mm Overlap at longitudinal joints	Visual Check and testing	X	W
	10	Cover Aggregate	During sealing operation	RFT, ITS	Section 63A10 Section 63A11(e)	Aggregate not contaminated Applied within 1 minute of Bitumen Spread evenly Rate as ordered	Visual Check and Testing	X	W
	11	Rolling	During Sealing	ITS	Section 63A11(f)	<500 v/l/d 1 hour per 1000m2 >500 v/l/d 1 hour per 1500m2 Speed 8kph not picking up stone.	Visual Inspection	X	W
Completion Requirements	12	Defect Correction	During Sealing	ITS	Section 63A15	Drag broom or hand swept, excess removed	Visual Inspection		
	13	Daily Records	During Sealing	ITS	Section 63A19(b)	Daily Spray Sheets	Submitted to Engineer at end of day	X	W
	14	Tolerance	During Sealing	ITS	Section 63A18(a)	50 mm of specified Edge line	Visual Inspection	X	W
	15	After care of Seal	After Sealing	ITS	Section 63A15(a)(i)	Traffic speed restricted to 30kph, Construction traffic restricted, Loose stone swept away min. 24 hours after application	Visual Inspection	W	H
	16	Pre-Handover	After sub-base completed	ATP, RFA, RFS, ITS & RFT	Job requirement	All Requests and checklists completed and signed	Review	H	H

H - Hold Point **W - Witness Point** **X - Self-Inspection**

Inspection & Test Plan
DOUBLE BITUMINOUS SURFACE TREATMENT (2nd LAYER – 7mm)

Engineer: Louis Berger Group
Contractor:
Contract Number:
Date Submitted:
Project Name:
Reference: ITP-DB2-001

	S/N	Operation or Stage of Work	Stage/Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
								Contractor	Engineer
ATP Requirements	1	Approval of underlying layer	Before commencement of sealing	RFS, ITS & RFT of underlying layer	Job Requirement	Underlying layer conforms to specs.	Documents to be submitted to Engineer for approval	H	H
	2	Pre-requisite approvals	Before commencement of sealing 7 days prior	RFA Seal Design, Source of supply of Bitumen, Cover Aggregate, and Method Statement	Section 63C02	ALD, Seal Design, Target Rates, Cover Aggregate and Bitumen Source approvals, and Method Statement meets Engineer's approval	Engineer's Review	H	H
	3	Cover Aggregate Source Testing	35kg sample provided 21 days prior to sealing 1 test per 1500 t Gradation 1 per 500t	RFT, Lab Reports	Section 63C03 Section 63A11 Section 63A02(f) Table 6300A/10 Table 6300A/17	Materials comply the rquirements of Division 6300A Grading as per Table 6300A/8 LAA - max 30% ACV - max 25% Soundness - max 12% Flakiness - max 14 Elongation - max 35 Agg. Dry Strength - min 210 Wet/Dry Ratio - 75%	AASHTO T89, T96, T104, T112, T210, ASTM D 1139-90, D 4791, D5821, RTA T230, AS1141.20.3	H	H
	4	Cover Aggregate Production Testing	Grading 1-test per 250m^3 LAA – 1 test per 1000m^3 Flakiness- 1test/250m^3 Soundness – 1 test/1000m^3	RFT, Lab Reports	Section 63A19 Table 63A19(a)	Grading as per Table 6300A/8	AASHTO T11, T27,	H	H
	5	Pre-coating Aggregate	Min 3 days prior to application of seal	ITS	Section 63A02(f)(i) Section 63C0(f)	Rate 12 litres/m2 90% diesel 10% AC	Visual Check	H	H
Construction Requirements	6	Weather Conditions	Before and During Sealing	ITS	Section 63A04(b)	Ambient Temperature above 15° C Work completed 2 hours before sunset	Visual Check	X	W
	7	Surface Preparation	Prior to Sealing	ITS	Section 63A07(a)	Surface clean of loose deleterious material, water, no defects and Prime Cured	Visual Check	X	W
	8	Bituminous material	Before commencement - 1 per tanker at delivery 2 x 1 litre containers	RFT Lab Reports	Section 63A02(a)	Bitumen AASHTO M20 or M226 Emulsion AASHTO M140 or M208	AASHTO M226	H	H

Inspection & Test Plan
DOUBLE BITUMINOUS SURFACE TREATMENT (2nd LAYER – 7mm)

	8	Addition of Cutter/Flux/Adhesion Agent	Prior to loading Bitumen	ITS	Section 63A12	As ordered by the Engineer, Mixed 700 litres per min for 20 min's before spraying	Visual Check	X	W
	9	Seal Coat (Bitumen application)	During sealing operation	RFT, ITS	Section 63A09	Building paper used at start of each run and nearby objects protected from splattering Spray evenly applied Application +/- 5% Target Rate Temperature per bitumen type 150mm Overlap at longitudinal joints	Visual Check and testing	X	W
	10	Cover Aggregate	During sealing operation	RFT, ITS	Section 63A10 Section 63A11(e)	Aggregate not contaminated Applied within 1 minute of Bitumen Spread evenly Rate as ordered	Visual Check and Testing	X	W
	11	Rolling	During Sealing	ITS	Section 63A11(f)	<500 v/l/d 1 hour per 1000m2 >500 v/l/d 1 hour per 1500m2 Speed 8kph not picking up stone.	Visual Inspection	X	W
Completion Requirements	12	Defect Correction	During Sealing	ITS	Section 63A15	Drag broom or hand swept, excess removed	Visual Inspection		
	13	Daily Records	During Sealing	ITS	Section 63A19(b)	Daily Spray Sheets	Submitted to Engineer at end of day	X	W
	14	Tolerance	During Sealing	ITS	Section 63A18(a)	50 mm of specified Edge line	Visual Inspection	X	W
	15	After care of Seal	After Sealing	ITS	Section 63A15(a)(i)	Traffic speed restricted to 30kph, Construction traffic restricted, Loose stone swept away min. 24 hours after application	Visual Inspection	W	H
	16	Pre-Handover	After sub-base completed	ATP, RFA, RFS, ITS & RFT	Job requirement	All Requests and checklists completed and signed	Review	H	H

H - Hold Point **W - Witness Point** **X - Self-Inspection**

Inspection & Test Plan
CULVERT EXCAVATION

Engineer: Louis Berger Group
Contractor:
Contract Number:
Date Submitted:
Project Name:
Reference: ITP-CUX-001

	S/N	Operation or Stage of Work	Stage /Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
								Contractor	Engineer
ATP Requirements	1	Pre-requisite Approvals acquired	Before excavation	De-mining certificate, approved Design, work method statement and any other requirements	Job requirement	All clearances received for commencement of work.	Documents to Engineer for approval	H	H
	2	Clear area of Vegetation and obstructions	Before excavation	ITS	Job requirment	Area cleared of Vegetation and obstructions	Visual Check of Site	H	W
Construction Requirements	3	Excavation to design	During excavation	ITS	Section 3205(a)(b)	Correctly excavated	Survey instruments and visual check of excavation to design	X	W
	4	Unsuitable Foundation	During excavation	RFT, lab reports	Section 3206	Remove and replace with Foundation Fill – max layers 150mm Moisture +/- 2% OMC	Visual Check of site and site measurement	X	W
	5	Foundation Fill	During excavation	ITS	Section 3101 Section 3106	Drainage channel diverted and excavation dewatered	Visual Check of site	X	W
	6	Remove and Dispose of existing structure (if necessary)	During excavation	ITS	Section 3208	Old structures removed and disposed properly as approved by the Engineer.	Visual check	X	W
	7	Protection of works	During excavation	ITS	Section 3101	Drainage channel diverted and excavation dewatered	Visual Check of site	X	W
	8	Backfill Material to be free of oversize and foreign matter	During embankment construction	ITS	Section 3110 Section 3211(a)	Max size 75mm Free of Foreign Matter	Visual check	X	W
Completion Requirements	9	Survey of Excavated ground	After excavation	RFS	Job requirement	Survey completed	Submit RFS to Engineer for approval.	H	W
	10	Compaction of Foundation Fill	After excavation	RFT	Section 3210	Min 95% MDD	AASHTO T 180	H	W
	11	Pre-Handover	After excavation	ATP, RFA, RFS, ITS, (& RFT for unsuitable excavation)	Job requirement	All Requests and checklists completed and signed	Review	H	H

H - Hold Point W - Witness Point X - Self-Inspection

Inspection & Test Plan
CULVERT INSITU CONCRETE POUR

Engineer: Louis Berger Group
Contractor:
Contract Number:
Date Submitted:
Project Name:
Reference: ITP CIC

	S/N	Operation or Stage of Work	Stage/Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
								Contractor	Engineer
ATP Requirements	1	Approval of culvert excavation/Precast Installation	Before commencement of Concrete Pour	RFT, ITS, RFS of underlying layer	Job requirement	Excavation/Previous pours conforms to specifications	Documents to be submitted to Engineer for approval	H	H
	2	Pre-requisite approvals acquired	Before commencement of Concrete Pour	RFA Source approval, Method Statements, Concrete Mix design, Culvert Design	Job requirement	Source approval and Method Statement meets Engineer's approval	Engineer's Review	H	H
	3	Concrete Material	1 per material type before production	RFT, lab reports	Section 3211(b)	Quality	AASHTO M 80	H	H
	4	Concrete Mix	1 per mix design before production	RFT, lab reports	Section 3211(b)	Mix design submitted 36 days prior an approved by the Engineer	Engineer's Review	H	H
Construction Requirements	5	Aggregate (Mix material)	1 per day before batching	RFT, lab reports	Section 8402(a)(b)(c)(d) Table 8402/2 Table 8402/3	Gradation LAA-40%max.	AASHTO M6, T11, T27, T176, M80, T96, T26	X	W
	6	Concrete Mix /Temperature	1 per load	RFT	Section 8404(a) to(i) Table 8404/1	Slump Temperature 11'C min – 36'C max	AASHTO T119, Field Measurement	X	W
	7	Delivery	Every load	Delivery docs	Section 8405 (e)	No concrete achieving initial set	Recording of Times and delivery docs.	X	W
	8	Weather Conditions	Prior to commencement of pour	ITS & Temperature recording	Section 8405 (i)	Normal 10 – 30 °C Cold Weather (<5 °C – Heat components) Hot weather (>30 °C – Shade and water cool components)	Visual Inspection	X	W

Inspection & Test Plan
CULVERT INSITU CONCRETE POUR

	9	Handling and Placement	During pouring of Concrete	ITS	Section 8406	No addition of water No Segregation No Voids/ Rock pockets No Foreign Matter Max time between trucks 30mins No Damage of existing works Max Lift 0.5m Max Drop of Concrete 1.5m Correctly consolidated	Visual inspection	X	W
	10	Joints	During concrete pour	ITS	Section 8407	As per design requirements	Visual Inspection and site measurement		
	11	Finishing Plastic Concrete	Completion of Pour	ITS	Section 8409	Strike off, float finished concrete, remove laitances and tool edges. Protect the surface	Visual Inspection	X	W
Completion Requirements	12	Curing	When the surface begins to dry after finishing completed.	ITS	Section 8410	Formwork in place for 7 days or Hessian - Water for 7 days Compound – application by spray 0.25 l/m2	Visual Inspection	X	W
	13	Formwork removal	In accordance with the minimum requirements stipulated in Table 8409/1	ITS	Section 8204(d) Table 8204-1	Concrete has attained sufficient strength to support its own mass.	Visual Inspection and records	X	W
	14	Remedial treatment of formed surfaces	After removal of forms	ITS	Section 8206(a) to (c)	Remove replace or repair defects for true and uniform finish, Rub brush (if Required)	Visual Inspection & Temperature Measurement	X	W
	15	Strength	Set of 3 units minimum per 40m3 or fraction each day production.	RFT	Section 8404 Table 8401-1	28 day design strength	AASHTO T23, T24	H	W
	16	Pre-Handover	After formwork removed and repairs completed	ATP, RFA, ITS & RFT	Job requirement	All Requests and checklists completed and signed	Review	H	H

H - Hold Point W - Witness Point X - Self-Inspection

Inspection & Test Plan
STONE MASONRY HEADWALL

Engineer: Louis Berger Group
Contractor:
Contract Number:
Date Submitted:
Project Name:
Reference: ITP SM-001

	S/N	Operation or Stage of Work	Stage/Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
								Contractor	Engineer
ATP Requirements	1	Approval of stone Masonry	Before commencement of stone masonry work	RFT, ITS, RFS of underlying layer	Job requirement	Culvert construction conforms to specifications	Documents to be submitted to Engineer for approval	H	H
	2	Pre-requisite approvals acquired	Before commencement of stone masonry work	RFA Source approval, Method Statements, Headwall Design	Job requirement	Source approval and Method Statement meets Engineer's approval	Engineer's Review	H	H
	3	Stone	Before commencement of stone masonry work	RFA	Section 3405(a)	Native stone to project	Engineer's Approval	H	H
Construction Requirement	4	Spreading Mortar	Prior to placing material	ITS	Section 3405(c)	Stones shall be wetted and set in a 6:1 sand:cement mortar.	Visual check	X	W
	8	Placing Stone	During and after Installing Stone Masonry	ITS	Section 3405(c)	Stones placed with longest face and exposed face parallel to the face.	Visual Check	X	W
Completion Requirement	10	Survey of Headwall	After Stone Masonry	RFS, Survey Report &	Job requirements	As per Approved Drawing Requirements	Submit RFS to Engineer for approval.	H	W
	11	Pre-Handover	After Stone Masonry	ATP, RFA, ITS & RFT	Job requirement	All Requests and checklists completed and signed	Review	H	H

H - Hold Point **W - Witness Point** **X - Self-Inspection**

Inspection & Test Plan
CULVERT INSTALLATION – RCBC (& other Precast Units)

Engineer: Louis Berger Group
Contractor:
Contract Number:
Date Submitted:
Project Name:
Reference: ITP CIB-001

	S/N	Operation or Stage of Work	Stage/Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
								Contractor	Engineer
ATP Requirements	1	Approval of culvert excavation	Before commencement of RCBC Installation	RFT, ITS, RFS of underlying layer	Job requirement	Culvert construction conforms to specifications	Documents to be submitted to Engineer for approval	H	H
	2	Pre-requisite approvals required	Before commencement of RCBC Installation	RFA Source approval, Method Statements, Pipes to be installed, Culvert Design	Job requirement Section 3203(a) Section 3209((b)(ii)	Source approval and Method Statement meets Engineer's approval	Engineer's Review	H	H
Construction Requirements	3	Bedding Materials	Prior to placing	ITS	Section 3209	Conformed to Section 3209	Visual check	X	W
	4	Precast Units	Prior to Installation	ITS	Dimensions Section 3202	Correct Dimension Undamaged	Visual check	X	W
	5	Precast Unit Connection	During Installation	ITS	Section 3209(a)	Fitted correctly Properly mortared joints	Visual Check	X	W
	6	Elevation and Alignment	After Placement of Units	ITS	Design requirements	As per approved drawing & alignment	Visual Check	X	W
Completion Requiremen	7	Survey	After installation	RFS, Survey Report &	Job requirements	As per Approved Drawing Requirements	Submit RFS to Engineer for approval.	H	W
	8	Pre-Handover	After RCBC Installed	ATP, RFA, ITS & RFT	Job requirement	All Requests and checklists completed and signed	Review	H	H

H - Hold Point **W - Witness Point** **X - Self-Inspection**

Inspection & Test Plan
CULVERT BACKFILL

Engineer: Louis Berger Group
Contractor:
Contract Number:
Date Submitted:
Project Name:
Reference: ITP CUB-001

	S/N	Operation or Stage of Work	Stage/Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
								Contractor	Engineer
ATP Requirements	1	Approval of constructed culvert	Before commencement of Backfill	RFT, ITS, RFS of underlying layer	Job requirement	Culvert construction conforms to specifications	Documents to be submitted to Engineer for approval	H	H
	2	Pre-requisite approvals acquired	Before commencement of Backfill	RFA Source approval, Method Statements	Job requirement	Source approval and Method Statement meets Engineer's approval	Engineer's Review	H	H
	3	Source/Compliance testing of Backfill Material	Before commencement of Backfill layer. 1 per 1000m^3	RFT, lab reports	Section 3210 Section 3211(a)	Max size 75mm Soil Classification A1, A2 CBR 4% @95%MDD	AASHTO T11, T27, T99, T189, M145	H	H
Construction Requirements	4	Backfill Material to be free of oversize and foreign matter	During embankment construction	ITS	Section 3210	Max size 75mm Free of Foreign Matter	Visual check	X	W
	5	Backfill against concrete structures	Prior to commencement of Backfill	ITS	Section 3210 Section 3211(a)	7 days or 80% design strength of the concrete structure	Visual check or Cylinder strength RFT	X	W
	6	Thickness of backfill layers (Foundation, Haunch and Backfill Zones)	During backfill	ITS	Section 3210	Compacted thickness -150mm max.	Visual check	X	W
	7	Moisture Control	During backfill	ITS	Section 3210	± 2% OMC	Site measurement	X	W
	10	Compaction of Backfill layers	2 tests per lift	RFT & ITS	Section 3210	MDD >90%	AASHTO T 99, T310	X	W
Completion Requirements	8	Final Backfill layers	Completion of backfill	RFT & ITS	Section 3210	Minimum depth cover	Site measurement	X	W
	11	Compaction record	After Layer completed	RFT & ITS	Section 3210	Compaction summary of all layers attached to RFT	Visual Check and Measurement	H	H
	12	Pre-Handover	After embankment completed	ATP, RFA, ITS & RFT	Job requirement	All Requests and checklists completed and signed	Review	H	H

H - Hold Point **W - Witness Point** **X - Self-Inspection**

Checklist – Foundation Preparation for Embankment

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-FDP-
Project Name: Date commenced:

Foundation Preparation for Embankment

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	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Approval to Proceed (ATP) to commence embankment submitted and approved? (Copy attached)		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Has the Construction survey control been put in place and adequate? (Limits of Embankmnet)		
	4.	Weather conditions favourable for commencement of preparatory works?		
Work Activities	5.	Has the topsoil been removed and placed in windrows / stockpiles ? (If unsuitable for use then removed from site)		
	6.	Has any existing road been tyned and pulverized?		
	7.	Is the existing foundations on a slope > 1:3 ? If so has the area been benched for Embankment placement?		
	8.	Has the area been tyned and compacted to 150mm depth?		
Pre-Handover	9.	Has compaction been tested and recorded? (min 90% MDD)		
	10.	Has the Site been left clean and free draining?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……..…../……/…… ……..…../……/……
LBG Inspector LBG Supervisor

ITP Attached

Checklist - Embankment

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-EMB-
Project Name: Date commenced:

Embankment

+ TO + , LEFT/RHS (circle one or both for full width) **LAYER - 1 / 2 / 3 / 4** (circle, 1 is bottom layer)

L x W(avg.) x D(avg.) = m^3 L x W(avg.) = m^2

	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Approval to Proceed (ATP) to commence embankment submitted and approved		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Has the Construction survey control been put in place and adequate?		
	4.	Are weather conditions favorable for embankment construction?		
Work Activities	5.	Is the embankment material free of oversize and foreign matter?		
	6.	Has the Embankment been compacted in layers not exceeding 200 mm?		
	7.	Is the Embankment slope to the correct alignment (Tolerance 100mm)		
	8.	Has Straight edge testing been conducted? Is the surface free of undulations, pot holes or other surface irregularities? (free draining)		
Pre-Handover	9.	Has Compaction testing of the Embankment works as per the ITP been carried out ?		
	10.	Has the Vertical Survey been undertaken and recorded (top layer only)		
	11.	Has the layer been 'Proof Rolled' and is acceptable?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……../……/……. ……../……/…….
LBG Inspector LBG Supervisor

ITP Attached

Checklist – Roadworks Excavation

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-EXC-
Project Name: Date commenced:

Excavation

+ TO + , LEFT/RHS
(circle one or both for full width)

	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Approval to Proceed (ATP) to commence embankment submitted and approved? (Copy attached)		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Has the Construction survey control been put in place and adequate? (Limits of excavation)		
	4.	Weather conditions favourable for commencement of excavation?		
Work Activities	5.	Has the Excavated Material been tested and identified for use in Embankment or disposed of as unsuitable in accordance with Section. 204.12?		
	6.	Has the area been cleared of Vegetation and obstructions?		
	7.	Has the Excavation been carried out to correct grade/profile?		
	8.	Has the drains been shaped filling in low spots to ensure free draining at the end of each day?		
Pre-Handover	9.	Has the Vertical Survey been undertaken and recorded (Extent of Excavation)		
	10.	Has the Site been left clean and free draining?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……..…../……/……. ……..…../……/…….
LBG Inspector LBG Supervisor

ITP Attached

Checklist – Sub-Grade

Engineer: Louis Berger Group
Contractor:
Contract Number:
Reference: ITS-SUG-
Project Name:
Date commenced:

SUB-GRADE + TO + , LEFT/RHS
(circle one or both for full width)

SUBGRADE - ON EMBANKMENT LAYER 1 / 2
- IN EXCAVATION

	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Approval to Proceed (ATP) to commence embankment submitted and approved? (Copy attached)		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Has the Construction survey control been put in place and adequate?		
	4.	Weather conditions favourable for Subgrade construction?		
Work Activities	5.	Subgrade on Embankment – Is the total depth 300mm (2 layers of 150mm)		
	6.	Subgrade Excavation - Has the Top 150 (Subgrade) been scarified and compacted?		
	7.	If Rock? Has the area been excavated 150mm below Subgrade and replaced with suitable material?		
	8.	Subgrade Material free of Oversize (>75mm) and foreign matter (vegetation etc.)?		
	9.	Is the Moisture Control during Compaction +/- 2% OMC		
	10.	Has any unsuitable areas been identified and removed (Measurements recorded on the Site measurement sheets) ?		
	11.	Has width been checked to ensure sufficient width for future layers?		
	12.	Has Straight Edge Checks been Conducted?		
Pre-Handover	13.	Has compaction been tested and recorded? (min 95% OMC)		
	14.	Has the Vertical Survey been undertaken and recorded? (top layer only)		
	15.	Has the Subgrade been 'proof rolled' and is acceptable?		
	16.	Has the Site been left clean and free draining?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……..…../……/…….
LBG Inspector

……..…../……/…….
LBG Supervisor

ITP Attached

Checklist – Stabilized Sub-Base

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-SUB-
Project Name: Date commenced:

Sub-Base
+ TO + , LEFT/RHS LAYER - 1 / 2
(circle one or both for full width) (circle, 1 is bottom layer)

L x W(avg.) x D(avg.) = m^3 L x W(avg.) = m^2

	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Has the Approval to Proceed (ATP) to commence aggregate base been given? (Copy attached)		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Has the Construction survey control been put in place and adequate?		
	4.	Are weather conditions favorable for Sub-base construction?		
Work Activities	5.	Has the Sub-base been compacted in layers not exceeding 150 mm?		
	6.	Has the sub-base material been compacted in the correct moisture range?		
	7.	Has Segregation testing been performed?		
	8.	Has the approved rolling pattern been used?		
	9.	Has Straight edge testing been conducted? Is the surface free of undulations, pot holes or other surface irregularities?		
Pre-Handover	10.	Has Compliance testing of the sub-base works as per the ITP been carried out ?		
	11.	Has the Vertical Survey been undertaken and recorded (top layer only)		
	12.	Has the layer been 'Proof Rolled' and is acceptable?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……../……/……. ……../……/…….
LBG Inspector LBG Supervisor

ITP Attached

Checklist – Stabilized Aggregate Base

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-ABC-
Project Name: Date commenced:

Aggregate Base

+ TO + , LEFT/RHS LAYER - 1 / 2
(circle one or both for full width) (circle, 1 is bottom layer)

L x W(avg.) x D(avg.) = m^3 L x W(avg.) = m^2

	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Has the Approval to Proceed (ATP) to commence aggregate base been given? (Copy attached)		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Has the Construction survey control been put in place and adequate?		
	4.	Are weather conditions favorable for aggregate base construction?		
Work Activities	5.	Has the Aggregate base been compacted in layers not exceeding 150 mm?		
	6.	Has the sub-base material been compacted in the correct moisture range?		
	7.	Has the approved rolling pattern been used?		
	8.	Has segregation testing been performed?		
	9.	Has Straight edge testing been conducted? Is the surface free of undulations, pot holes or other surface irregularities?		
Pre-Handover	10.	Has Compaction testing of the aggregate base works as per the ITP been carried out ?		
	11.	Has the Vertical Survey been undertaken and recorded (top layer only)		
	12.	Have the Side Drains been cut and is acceptable?		
	13.	Has the layer been 'Proof Rolled' and is acceptable?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……../……/……. ……../……/…….
LBG Inspector LBG Supervisor

ITP Attached

Checklist - Prime Coat

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-PCO-
Project Name: Date commenced:

Prime Coat
+ TO + , LEFT/RHS
(circle one or both for full width)

L x W(avg.) = m^2

	S/N	Checklist activity	Engineer	Comments
Preparation Activities	1.	Has the Approval to Proceed (ATP) to commence aggregate base been given? (Copy attached)		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Are weather conditions favorable for Prime?		
	4.	Has the Materials certificate has been received for the tanker?		
Work Activities	5.	Has the Underlying layer been cleaned of loose material?		
	6.	Tar paper applied at start of run?		
	7.	Has prime been applied at correct Temperature?		
	8.	Has the prime been applied at the target spray rate?		
	9.	Prime coat has been applied evenly across the area?		
	10	Has samples for compliance testing of the prime coat works as per the ITP has been carried out?		
Pre-Handover Activities	11.	Has Blotter been applied evenly? (if required)		
	12.	Has surface been kept clean and free of loose material?		
	13.	Prime coat has cured before opening to traffic or placement of wearing course		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……../……/……. ……../……/…….
LBG Inspector LBG Supervisor

ITP Attached

Checklist – DBST (14mm)

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-DB1-
Project Name: Date commenced:

DBST 19mm

+ TO + , LEFT/RHS
(circle one or both for full width)

L x W(avg.) = m^2

	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Has the Approval to Proceed (ATP) to commence aggregate base been given? (Copy attached)		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Are weather conditions favorable for Sealing?		
	4.	Has the Materials certificate and samples been received for the tanker?		
	5.	Has the Aggregate been pre-coated in the correct timeframe and application?		
Work Activities	6.	Has the Underlying layer been cleaned of loose material?		
	7.	Has Builders paper been applied at start of each run?		
	8.	Has the bitumen been applied evenly across the area at correct Temperature and target spray rate?		
	9.	Has the aggregate been applied evenly at the correct target spread rate?		
	10.	Has Compliance (Spray and spread rate) testing of the works as per the ITP has been carried out and recorded? Has the rates been adjusted accordingly?		
	11.	Is the cover aggregate clean (not contaminated)?		
Pre-Handover Activities	12.	Has defects been corrected (blotter or swept)?		
	13.	Has surface been kept clean and free of loose material?		
	14.	Has the traffic been restricted for the first 24 hours?		
	15.	Has excess cover aggregate been swept away after 24 hours under traffic?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……../……/……. ……../……/…….
LBG Inspector LBG Supervisor
ITP Attached

Checklist – DBST (7mm)

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-DB2-
Project Name: Date commenced:

DBST 10mm

+ TO + , LEFT/RHS
(circle one or both for full width)

L x W(avg.) = m^2

	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Has the Approval to Proceed (ATP) to commence aggregate base been given? (Copy attached)		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Are weather conditions favorable for Sealing?		
	4.	Has the Materials certificate and samples been received for the tanker?		
	5.	Has the Aggregate been pre-coated in the correct timeframe and application?		
Work Activities	6.	Has the Underlying layer been cleaned of loose material?		
	7.	Has Builders paper been applied at start of each run?		
	8.	Has the bitumen been applied evenly across the area at correct Temperature and target spray rate?		
	9.	Has the aggregate been applied evenly at the correct target spread rate?		
	10.	Has Compliance (Spray and spread rate) testing of the works as per the ITP has been carried out and recorded? Has the rates been adjusted accordingly?		
	11.	Is the cover aggregate clean (not contaminated)?		
Pre-Handover Activities	12.	Has defects been corrected (blotter or swept)?		
	13.	Has surface been kept clean and free of loose material?		
	14.	Has the traffic been restricted for the first 24 hours?		
	15.	Has excess cover aggregate been swept away after 24 hours under traffic?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……../……/……. ……../……/…….
LBG Inspector LBG Supervisor
ITP Attached

Concrete Pour Record

Engineer: Louis Berger Group
Contractor:
Contract Number:
Reference: ITS-CON-
Project Name:
Date Commenced:

Location :
ATP No. :
Date :
Attached Drawing No.:

Type of Structure: ☐ Culvert ☐ Bridge ☐ Channels ☐ Others

1	2	3	4	5	6	7
Load	Time Batched	Time arrival on Site	Time difference (3-2)	Slump	Time of Completion of Pour	Time between pours
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Testing references:

Attach to ITS

……/……/…….. ……/……/……..
LBG Inspector LBG Supervisor

Checklist – Culvert Excavation

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-CUX-
Project Name: Date commenced:

Culvert Excavation Culvert Km + , LEFT/RHS/BOTH (circle one)

	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Approval to Proceed (ATP) to commence culvert excavation submitted and approved? (Copy attached)		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Has the Construction survey control been put in place and adequate? (Limits of excavation)		
	4.	Weather conditions favourable for commencement of culvert excavation?		
Work Activities	5.	Has the area been cleared of vegetation and obstructions?		
	6.	Has the Excavation been carried out to correct design/profile?		
	7.	Has the works been protected with diversion drains, check dams and dewatered?		
	8,	(If necessary) has any existing culverts been removed and disposed of as approved by the Engineer?		
	9.	Has any unsuitable foundation been identified, excavated and measurements recorded?		
	10.	(If necessary) has a foundation seal been placed and strength tests recorded?		
	11.	Is the foundation fill material clean, free of foreign matter and to specification?		
	12.	Has the excavation base filled to correct level with clean foundation fill and compacted?		
Pre-Handover	13.	Has the culvert foundation been compacted and tested (95%MDD)		
	14.	Has the Survey been undertaken and recorded (Extent of Excavation)		
	15.	Has the Site been left clean and free draining?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……..…../……/…… ……..…../……/……

LBG Inspector LBG Supervisor

ITP Attached

Checklist – Culvert Insitu Concrete Setup

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-CIS-
Project Name: Date commenced:

Culvert Excavation **R.L. Upstream _____**

Culvert Km + , LEFT/RHS/BOTH (circle one) **R.L. Downstream _____**

	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Approval to Proceed (ATP) to commence culvert excavation submitted and approved? (Copy attached)		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Has the Construction survey control been put in place and adequate? (Control marks)		
	4.	Weather conditions favourable for setting up for a concrete pour?		
Work Activities	5.	Has the area to be setup on been prepared correctly (compacted / cleaned) ?		
	6.	Is the reinforcement bars the correct size and shape?		
	7.	Has the reinforcement bars been installed correctly - the correct number and spacing? (see drawings)		
	8.	Is the reinforcement clean and correctly supported (bar chairs/ concrete blocks)		
	9.	Has the reinforcement been secured correctly – correct ties and overlaps?		
	10	Has the Formwork been cleaned, oiled and correctly installed (to support the load of wet concrete)?		
	11.	Is the cover between reinforcement steel and formwork correct (Min 50mm)		
	12.	Have construction/Expansion Joints been marked/correctly installed?		
Pre-Handover	13.	Has the Survey been undertaken to check the setup is within tolerances?		
	14.	Has the Site been left clean and free draining?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……..…../……/……. ……..…../……/…….
LBG Inspector LBG Supervisor
ITP Attached

Checklist – Culvert Insitu Concrete Pour

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-CIC-
Project Name: Date commenced:

Culvert Km + , LEFT/RHS/BOTH (circle one) **R.L. Upstream _____**
R.L. Downstream_____

	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Approval to Proceed (ATP) to commence Insitu Concrete Pour submitted and approved? (Copy attached)		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Has the Construction survey control been put in place and adequate? (Control marks)		
	5.	Has the area that has been set up been prepared correctly (kept clean) ?		
	6.	Has the Quality control been completed for the concrete at the plant?		
	7.	Has correct preparations been made for the weather conditions for the pour. (<10 apply heat >30 cool down)		
Work Activities	8.	Has the batching certificates been received and was the time between batching and pour recorded? Is this within specifications?		
	9.	Has slump test been taken and recorded? If outside limits was it removed from site?		
	10.	Has the concrete been handled correctly (no addition of water, cement?)		
	11.	Has the concrete been handled correctly (no segregation or voids) drop of less than 2m		
	12.	Have lifts of concrete been less than 0.5m		
	13.	Has the concrete been consolidated (Vibrated) correctly?		
	14.	Were intervals between trucks less than 30 min's? (record times)		
	15.	Has the Construction/Expansion Joints been installed as required?		
	16.	Has the surface been float finished, laitances removed and tool edged?		
	17.	Has the finished surface been protected from rain (if necessary)?		
Pre-Handover	18.	Has curing commenced within the correct timeframe? State type of curing?		
	19.	Has Curing been carried our correctly for the correct time duration?		
	20.	Was the formwork removed after the correct time duration?		
	21.	Was any damage caused from the removal of the formwork? If so was this repaired?		
	22.	Has any defects been identified and repaired? (state defects)		
	23.	Has the surface been finished to a true uniform finish? (Rubbed if necessary)		
	24.	Has the Site been left clean and free draining?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……..…../……/…… ……..…../……/……
LBG Inspector LBG Supervisor
ITP / Pour record Attached

Checklist – Culvert Installation (RCBC)

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-CIB-
Project Name: Date commenced:

Installation of Reinforced Concrete Box Culverts **R.L. Upstream _____**

Culvert Km + , LEFT/RHS/BOTH (circle one) **R.L. Downstream _____**

	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Approval to Proceed (ATP) to commence placement of Reinforced Concrete Box Culvert (RCBC) submitted and approved? (Copy attached)		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Has the Construction survey control been put in place and adequate (Location of units)		
	4.	Weather conditions favourable for commencement of placing of RCBC's?		
Work Activities	5.	Has the Base slab been prepared and cleaned?		
	6.	Are the culvert units to the correct size and undamaged?		
	7.	Have the Culverts been fitted correctly / undamaged?		
Pre-Handover	8.	Has the Survey been undertaken and recorded (Correct width/Position)?		
	9.	Has the Site been left clean and free draining?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……..…../……/……. ……..…../……/…….
LBG Inspector LBG Supervisor

ITP Attached

Checklist – Culvert Installation (RCP)

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-CIP-
Project Name: Date commenced:

Installation of Reinforced Concrete Box Culverts **R.L. Upstream _____**

Culvert Km + , LEFT/RHS/BOTH (circle one) **R.L. Downstream _____**

	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Approval to Proceed (ATP) to commence placement of Reinforced Concrete Box Culvert (RCP) submitted and approved? (Copy attached)		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Has the Construction survey control been put in place and adequate (Location of units)		
	4.	Weather conditions favourable for commencement of placing of RCP's?		
Work Activities	5.	Is the Bedding material clean, free of foreign matter and to specifications? (max. size 12.5mm)		
	6.	Are the culvert units to the correct size and undamaged?		
	7.	Is the bedding material the correct min depth?		
	8.	Has the bedding material been left un-compacted and shaped for the pipes to sit in position?		
	9.	Have the Pipes been fitted correctly / undamaged?		
Pre-Handover	10.	Has the Survey been undertaken and recorded (Correct width/Position)?		
	11.	Has the Site been left clean and free draining?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……..…../……/…… ……..…../……/……

LBG Inspector LBG Supervisor

ITP Attached

Checklist – Culvert Installation (Stone Masonry)

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-CSM-
Project Name: Date commenced:

Installation of Reinforced Concrete Box Culverts **R.L. Upstream _____**

Culvert Km + , LEFT/RHS/BOTH (circle one) **R.L. Downstream _____**

	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Approval to Proceed (ATP) to commence placement of Reinforced Concrete Box Culvert (RCP) submitted and approved? (Copy attached)		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Has the Construction survey control been put in place and adequate (Location of units)		
	4.	Weather conditions favourable for commencement of placing of Stone Masonry		
Work Activities	5.	Has the excavated base been compacted (90%), and cleaned?		
	6.	Has mortar sample been taken for testing?		
	7.	Has the mortar been spread at the correct thickness?		
	8.	Has the stones been placed with the longest face and exposed face parallel to the face?		
	9.	For the base, has time been allowed for the mortar to set before placing concrete finish		
	10.	Has the base been cleaned prior to placing the concrete finish		
	11.	Has the concrete finish been floated for a smooth finish?		
Pre-Handover	12.	Has the Survey been undertaken and recorded (Correct width/Position)?		
	13.	Has the Site been left clean and free draining?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……..…../……/……. ……..…../……/…….
LBG Inspector LBG Supervisor

ITP Attached

Checklist – Culvert Backfill

Engineer: Louis Berger Group Contractor:
Contract Number: Reference: ITS-CUB-
Project Name: Date commenced:

Culvert Backfill

Culvert Km + , LEFT/RHS (circle one or both for full width) **NUMBER OF LAYER -** (See attached Backfill Record)

L x W(avg.) x D(avg.) = m^3 L x W(avg.) = m^2

	S/N	Checklist activity	Y/N/NA	Comments
Preparation Activities	1.	Approval to Proceed (ATP) to commence Backfill of Culvert submitted and approved		
	2.	Has the Traffic management been put in place and is adequate? (if applicable) – See Approved TMP		
	3.	Has the Construction survey control been put in place and adequate?		
	4.	Are weather conditions favorable for Backfill of Culvert?		
Work Activities	5.	Is the Backfill material free of oversize and foreign matter?		
	6.	Has the Backfill been compacted in layers not exceeding 150 mm? (Foundation, haunch and Backfill zones)		
	7.	Has each layer (zone) been tested for compaction?		
	8.	Is the Moisture content correct for compaction (+/- 2% OMC)		
Pre-Handover	9.	Has Compaction testing of the Backfill works as per the ITP been carried out and recorded?		
	10.	Has the Compaction Records been completed and attached?		
	11.	Has the completed Backfill been inspected and is acceptable?		

Additional Comments:

If answer no on any of the above state reason or raise NCR! NCR No. _____

……../……/…… ……../……/……
LBG Inspector LBG Supervisor

ITP Attached

Culvert Backfill Record

Engineer: Louis Berger Group
Contractor:
Contract Number:
Reference: ITS-CUB-
Project Name:
Date Commenced:

Location :
ATP No. :
Date :
Attached Drawing No.:

Layer	LHS		RHS		Comments
	Density 1	Density 2	Density 1	Density 2	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Note: Backfill either side of culvert 2 per side per lift (Section 208.11)
Backfill full width road-base at least 3 tests per lift (Section 204.10.3.4)
Testing references:

Attach to ITS

……/……/…….. ……/……/……..
LBG Inspector LBG Supervisor

Appendix D

Site Measurement Form

Site Measurement sheet
(SM)

Engineer: Louis Berger Group
Contractor:
Contract Number:
Reference: SM-
Project Name:
Date:

Description (Attach sketch if necessary)

Quantities As Measured

BOQ Item	Unit	Quantity	BOQ Item	Unit	Quantity

Measured by: _____ Date: _____ (dd/mm/yy)
(Contractor)

Measured by: _____ Date: _____ (dd/mm/yy)
(LBG)

Contractor's representative: _____ Date: _____ (dd/mm/yy)

Engineer's Representative: _____ Date: _____ (dd/mm/yy)

Notes:
1. The above quantities are measured in the field and does not constitute an agreed measure for payment.
2. The agreed measurement does not imply that the works have been approved and accepted for payment.

Appendix E

Site Instruction Form

Site Instruction
(SI)

Engineer: Louis Berger Group
Contract Number:
Project Name:

Contractor:
Reference: SI-
Date:

Site Instruction Description

Instructed by: _____ (LBG)

Date: _____ (day/month/year)

Time: _____

Received by: _____ (Contractor)

Date: _____ (day/month/year)

Time: _____

Post-Compliance Description

Contractor's representative: _____

Date: _____ (day/month/year

LBG's Representative: _____

Date: _____ (day/month/year)

Appendix F

Non-Conformance Report

NON CONFORMANCE REPORT

(NCR)

Engineer : The Louis Berger group, Inc.
Contract Number :
Project Name :
Reference : Sub-Clause 37.4 (Conditions of Particular Application)

Contractor :
Reference : NCR - -
Date :

TO :

Attachment: Drawing / Sketch / Document :

DEFICIENCY / RECORD : (Description of the non conformity of the work or product)

Acknowledgement of receipt by Contractor: Name: Date: Signature:

Remedial Work Proposed by Contractor

Remedial Works will be carried out by the date below

Name of Contractor's Representative

Date:

Signature

The Louis Berger Group, Inc.	**Proposed Remedial Work**	**Inspected by LBG**
	ACCEPTABLE : ☐ *NOT ACCEPTABLE* ☐	*Remedial work acceptable :* ☐ *Remedial work unacceptable :* ☐
Date:	Date:	Date:
Name:	Name:	Name:
		Signature:

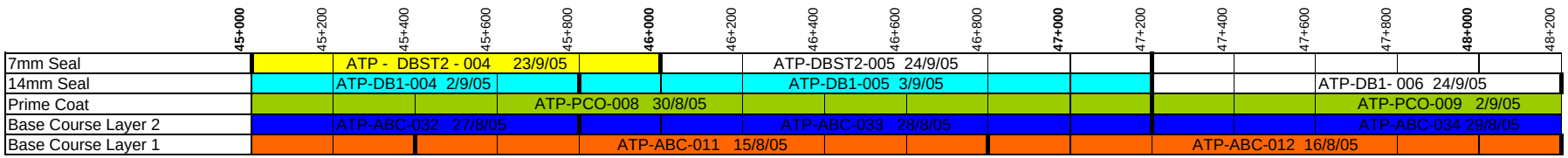
Appendix G

Work Progress Chart/Summary Chart

Step 1 - On approval of ATP mark the extent of the ATP and fill in with the ATP number and Date
Step 2 - On completion of the work the ATP is coloured in.

Note - Layer references can be adjusted to meet particular design needs.

Example of chart in progress



DBST (Full Width)

Plan View of Road or Reference Features

45+650 Intersection

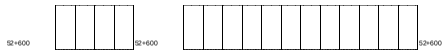
46+640 Curve 18

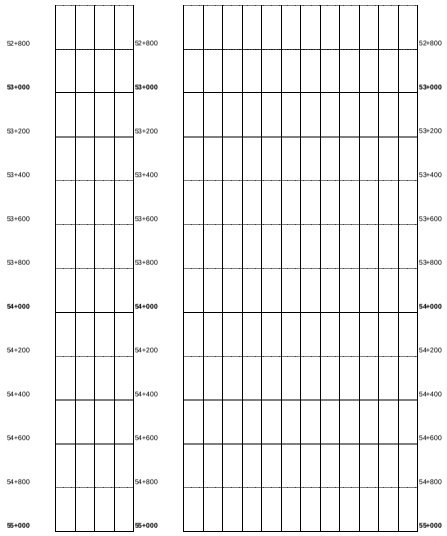
47+250 AWC Tower

	45+000	45+200	45+400	45+600	45+800	46+000	46+200	46+400	46+600	46+800	47+000	47+200	47+400	47+600	47+800	48+000	48+200	48+400	48+600	48+800	49+000	49+200	49+400	49+600	49+800	50+000	50+200	50+400	50+600	50+800	51+000	51+200	51+400	51+600	51+800	52+000	52+200	52+400
7mm Seal																																						
14mm Seal																																						
Prime Coat																																						
Base Course Layer 2																																						
Base Course Layer 1																																						
Sub-Base Course Layer 2																																						
Sub-Base Course Layer 1																																						
Sub-Grade Layer 2																																						
Sub-Grade Layer 1																																						
Embankment /Excavation Layer																																						

	45+000	45+200	45+400	45+600	45+800	46+000	46+200	46+400	46+600	46+800	47+000	47+200	47+400	47+600	47+800	48+000	48+200	48+400	48+600	48+800	49+000	49+200	49+400	49+600	49+800	50+000	50+200	50+400	50+600	50+800	51+000	51+200	51+400	51+600	51+800	52+000	52+200	52+400
Approved alignment																																						
Original Survey																																						
OGL quality testing																																						
De-Mining Certificate																																						

45+000 45+200 45+400 45+600 45+800 46+000 46+200 46+400 46+600 46+800 47+000 47+200 47+400 47+600 47+800 48+000 48+200 48+400 48+600 48+800 49+000 49+200 49+400 49+600 49+800 50+000 50+200 50+400 50+600 50+800 51+000 51+200 51+400 51+600 51+800 52+000 52+200 52+400


52+600
52+600
52+600


52+800
53+000
53+200
53+400
53+600
53+800
54+000
54+200
54+400
54+600
54+800
55+000

Drainage Schedule

Culvert Number	Distance	Culvert Type	LHS/RHS /Both	Excavation		Base Slab				Insitu Culvert			
						Setup		Concrete		Setup		Concrete	
				ATP	Date	ATP	Date	ATP	Date	ATP	Date	ATP	Date
1		RCP	LHS										
			RHS										
2		RCBC	LHS										
			RHS										
3		Insitu	LHS										
			RHS										
4		Stone Pitch	LHS										
			RHS										
5			LHS										
			RHS										
6			LHS										
			RHS										
7			LHS										
			RHS										
8			LHS										
			RHS										
9			LHS										
			RHS										
10			LHS										
			RHS										
11			LHS										
			RHS										
12			LHS										
			RHS										
13			LHS										
			RHS										
14			LHS										
			RHS										
15			LHS										
			RHS										
16			LHS										
			RHS										
17			LHS										
			RHS										

Pipe/Box/Precast Installation		Inlet Structure/ Headwall				Outlet Structure/ Headwall				Backfill	
		Setup		Concrete		Setup		Concrete			
ATP	Date	ATP	Date	ATP	Date	ATP	Date	ATP	Date	ATP	Date