Preliminary Data

Before start of field work we must collect several files from respective department. The data from files will be compared with the actual field data.

1. Estimate.
2. Measurement Book.
3. Bill form.
4. Work completion file from ITDP.
5. Village map with location of structure.

Village map with location of structure will be useful during field visit to find the structure.

If measurement book and estimate are available, then collect data from measurement book as per Format for field assessment table, else use estimate to collect the data.

From the bill form find the agency / contractor name, total amount paid, technical sanction and administrative sanction number.

During assessment particular structure not found in village then cross verify it with work completion file. There may be two conditions

i. Payment was made to agency and construction was not done – This is clear fraud. In this case capture data from work completion file and add work completion picture in our report.
ii. Payment was not made to agency – In this case actual work was not completed even though it has administrative and technical sanction. Entry of this work should not be found in work completion file. In this case we will not have any data such as bill form and measurement book of this work.

Visit Detail

IIT Work ID.	V…	Constructed in	
Visit Date:	../../2017	Team Member	..
Local resident:		Contact:	
Liaison (Post)		Contact:	

DATA from bill form and work completion

Data From Estimate	
Technical Sanction	
Administrative Sanction	
GS Approval	
Data From Bill Form	
Amount paid	
Contractor	

Year of Completion	
Amount as per work completion report	

Note- Verify technical sanction and administrative sanction number in bill form with work completion file.

Instruments required

1. Measuring tape and 1ft ruler.
2. Measuring wheel
3. Any two wheeler vehicle
4. Hoe (Kudal) and spade
5. GPS or GPS enable mobile
6. Wire Brush
7. Rebound Hammer and graph (strength Vs rebound number)
8. Reference sheets for identification of type of roof and truss

Software and Apps

1. Google Earth
2. QGIS
3. ODK with loaded blank forms for all structures
4. GPS Essential/ my track

Bitumen Road

Check list for bitumen road

1. Length, width.
2. Shoulder.
3. Drain.
4. Wearing coat (liquid seal coat).
5. Binder coat.
6. Sub-base and base thickness.

   Two persons are needed for this test (A and B).

Steps to be followed for bitumen road inspection

1. Find the structure. Fix the reference point [1]near to road (i.e., hand pump, bore well, house, tree, well etc.).Take the location of reference point. B will start tracking the location. Use ODK app to collect the field data.
2. Measuring wheel is attached to vehicle. A will ride the bike and B who is sitting behind will be having GPS device / mobile. Firstly, A and B will move along entire stretch of road. B will note down the total length of road at end point. In this rideability, visual distress, pavement surface conditions will be observed.
3. Count the number of culverts in first ride.
4. In return journey observe the drainage if present in the estimate. Note down width of road, shoulder and dimension of drain at suitable interval of 100 m. Mark the test spot with paint. Take image.
5. B will note down the chainage of best patch[2], If best patch is found throughout the length then samples for step 8 will be at an interval of 100 m.
6. If rideability rating is 0/1/2 and wearing coat is found to be absent in 70 % of road length, then road fails in the first test itself. Take minimum 3 images along with location.
7. If road passes in above test (point number 5) then follow the next steps.
8. With help of hoe, make a small pit at shoulder so that layers get exposed. Use brush for cleaning the surface or layers. At the same point, find **crust thickness** by ruler and number of layers. Note down thickness of each layer. Take Image and location.
9. Follow same procedure (step 8) for other points.

[1] It must be permanent point, visible and easily accessible.
[2] Best patch – section of road with comparatively maximum riding comfort and least distress

Format for field assessment

	Data		Assessment score
	Estimate	**Field Measurement**	
Total length of road (km)			
Shoulder Width (m)			
Drainage(m^3)			
Avg. Width of Road(m)			
Spade Test Result			
No. of Layers			
Layer Name			
Wearing Coat + Binder (mm)			
Base + Sub Base			
Surface condition Rating		…/100	NA
Rideability Rating		../5	NA
Signboard:			

Observations from villagers	
At the time of construction sub grade is compacted	
The Roller is use for Road Compaction	
Wearing coat/ sealant/ top layer of bitumen put at time of construction?	
The Location/coverage of Bituminous Road is right according to people (Y/N)	
Has this work been done from any other scheme? When? If yes, which scheme? Also why was it taken under TBY again?	

Rideability rating

Ride Rating	**Description**
0	Ride not known or not determined.
1	Passengers notice a very uncomfortable ride. The road is rough enough to easily knock the vehicle out of alignment. The vehicle must be slowed considerably.
2	Approximately 70 % of the pavement section gives a rough ride.
3	Approximately 50 % of the pavement section is rough. In a concrete section, almost every joint produces a pronounced bump. The highest rideability rating for a gravel road should be a 3.
4	Occasional isolated areas of roughness are present, as in the case of a few joints being faulted or a few bumps being present.
5	There are no areas that are rough. Passengers observe a smooth ride.

Surface condition rating

Rating	Surface Condition Description
100 to 86 (excellent)	The pavement surface is in excellent condition. Distress- generally free of any distress Cracks- low-severity hairline cracks Depressions may be visible
85 to 71 (very good)	The pavement surface is in very good condition, cracks -Transverse and longitudinal crack widths are generally less than 3 mm (1/8 in) wide. Block cracking patterns may be appearing, but cracks have not deteriorated greatly. Spalling-Some minor or faulting may be present along the cracks. Rutting- Minor
70 to 56 (good)	The pavement surface is generally in good condition. Cracks- Transverse and longitudinal cracks are between 6 and 12 mm (0.25 and 0.50 in) wide and may exhibit some deterioration (spalling). Depressions in cracked areas, Alligator cracking may be evident in the wheel paths. Rutting- is becoming more pronounced, and some shoving may occur at intersections. Minor patching may be present as a result of surface distresses or utility settlements.
55 to 41 (fair)	The pavement surface is in fair condition. Deterioration- is much more advanced. Cracks- Many reflective cracks are present on overlaid pavements. Block cracking is common and weathering is noticeable, with detrimental effects to the pavement. Some reflective cracks may be faulted or have medium- to high-severity spalls.
40 to 26 (poor)	The pavement surface is in poor condition with poor rideability. Cracks - Alligator cracking is severe, and potholes may be present. Rutting- is common and, in some instances, is greater than 20 mm (0.75 in). The pavement edge may be deteriorated, and over 60 m (200 ft) of cracking per 90 square meters (1,000 sq ft) of pavement is present.

Weightage

Parameter	Weightage
Length(L)	If LActual/LDesign > 1 then 1; Else if LA/LD<0.8 then 0; Else (LA/LD)
Width(W)	If WActual/WDesign > 1 then 1; Else if WA/WD<0.8 then 0; Else (WA/WD)
Binder + bitumen(T)	TActual/TDesign.>1 then 1 Else if TA/TD<0.4 then 0; Else (TA/TD)
Sub base+ base(B)	BActual/BDesign.>1 then 1 Else if BA/BD<0.6 then 0; Else (BA/BD)
Shoulder(S)	If Width>0.5m then 1, else 0
Drainage(D)	If present on >60 % length then 1, Else 0
Sign Board(SB)	1- If present, 0- Not Present

Score = 0.9*(L*W*T*B)+(0.1*(S+D+SB)/3); Road fails if total score < 0.15

Road failures built into above scoring are (anyone of the below):

1. Observed length is less than 80 % of design/ MB
2. Width is less than 2.4 m.
3. Wearing coat and binder was not provided on 70% of length
   In most cases wearing coat is missing. So road fails if binder is not provided > 70 %
   If wearing coat and binder is less than 40 % of design.
4. If layer(sub base + base) thickness < 60 % of design

Old

1. Wearing + binder coat present and rideability >3; then road pass in visual inspection
2. Carry out dimension test as per table.
3. Assessment – OK /Not OK

Concrete road

Check list for concrete road

1. Length, width.
2. Shoulder.
3. Drain.
4. Concrete thickness
5. Sub-base and base thickness.
6. Strength by rebound hammer

   Two persons are needed for this test (A and B).

Steps to be followed for concrete road inspection

1. Find the structure. Fix the reference point [3]near to road (i.e hand pump, bore well, house, tree, well etc).Take the location of reference point. B will start tracking the location. Use ODK app to collect the data.
2. Measuring wheel is attached to vehicle. A will ride the bike and B who is sitting behind will be having GPS device / mobile. Firstly, A and B will move along entire stretch of road. B will note down the total length of road at end point. In this ride ability, visual distress, pavement conditions will be observed.
3. Count the number of culverts in first ride.
4. In the return journey observe the drainage if present in the estimate. Note down width of road, shoulder and dimension of drain at chainage interval of 100 m. Mark the test spot with paint. Take image.
5. B will note down the chainage of best patch[4], If best patch is found throughout the length then samples for step 7 will be at an interval of 100 m)
6. If rideability rating is 0/1/2 and concrete is not found in 70 % of road length, then road fails in the first test itself. Take minimum 3 images along with location.
7. If road passes in above test (point number 5) then follow the next steps.
8. Find out thickness of (Sub base+base) layer.
9. At the same point find thickness of concrete slab and thickness and number of under lying layers. Take Image and location.
10. Carry out rebound hammer test at best patch. Select patch (1.5 m in length and width equal to road width) and carry out test at minimum three locations (edge, corner and center). At each location take eight readings of rebound number and find the average for that location. Average of these three locations will give the final result, which can be calculated in excel sheet for the purpose. Take GPS location and image.
11. Follow same procedure (step 6 to 10) for other points.

---

[3] It must be permanent point, visible and easily accessible.

[4] Best patch – section of road with comparatively maximum riding comfort and least distress

Format for field assessment

	Data		Assessment Score
	Estimate	**Field Measurement**	
Total length of road (km)			
Avg Width of Road(m)			
Shoulder Width(m)			
Drainage			
Spade Test Result			
No. of Layers			
Layer Name	Thickness		
Concrete			
Sub base + Base			
Rebound Hammer Test Result			
Strength of Road (MPa)			
Surface condition Rating	../100		NA
Rideability Rating	../5		NA
Sign Board			

Observations from villagers	
At the time of construction sub grade is compacted	
Vibrator/ Manual compaction is done	
The Location/coverage of Concrete Road is right according to people (Y/N)	
Has this work been done from any other scheme? When? If yes, which scheme? Also why was it taken under TBY again?	
Formwork is properly aligned?	

Rideability rating

Ride Rating	Description
0	Ride not known or not determined.
1	Passengers notice a very uncomfortable ride. The road is rough enough to easily knock the vehicle out of alignment. The vehicle must be slowed considerably.
2	Approximately 70 % of the pavement section gives a rough ride.
3	Approximately 50 % of the pavement section is rough. In a concrete section, almost every joint produces a pronounced bump. The highest rideability rating for a gravel road should be a 3.
4	Occasional isolated areas of roughness are present, as in the case of a few joints being faulted or a few bumps being present.
5	There are no areas that are rough. Passengers observe a smooth ride.

Surface condition rating

Rating	Surface Condition Description
100 to 86 (excellent)	The pavement surface is in excellent condition. Distress- generally free of any distress Cracks- low-severity hairline cracks Depressions may be visible
85 to 71 (very good)	The pavement surface is in very good condition, cracks -Transverse and longitudinal crack widths are generally less than 3 mm (1/8 in) wide. Block cracking patterns may be appearing, but cracks have not deteriorated greatly. Spalling-Some minor or faulting may be present along the cracks. Rutting- Minor
70 to 56 (good)	The pavement surface is generally in good condition. Cracks- Transverse and longitudinal cracks are between 6 and 12 mm (0.25 and 0.50 in) wide and may exhibit some deterioration (spalling). Depressions in cracked areas, Alligator cracking may be evident in the wheel paths. Rutting- is becoming more pronounced, and some shoving may occur at intersections. Minor patching may be present as a result of surface distresses or utility settlements.
55 to 41 (fair)	The pavement surface is in fair condition. Deterioration- is much more advanced. Cracks- Many reflective cracks are present on overlaid pavements. Block cracking is common and weathering is noticeable, with detrimental effects to the pavement. Some reflective cracks may be faulted or have medium- to high-severity spalls.
40 to 26 (poor)	The pavement surface is in poor condition with poor rideability. Cracks - Alligator cracking is severe, and potholes may be present. Rutting- is common and, in some instances, is greater than 20 mm (0.75 in). The pavement edge may be deteriorated, and over 60 m (200 ft) of cracking per 90 square meters (1,000 sq ft) of pavement is present.

Weightage

Parameter	Weightage
Length(L)	If LActual/LDesign > 1 then 1; Else if LA/LD<0.8 then 0; Else (LA/LD)
Width(W)	If WActual/WDesign > 1 then 1; Else if WA/WD<0.8 then 0; Else (WA/WD)
Concrete thickness(T)	TActual/TDesign.>1 then 1 Else if TA/TD<0.4 then 0; Else (TA/TD)
Sub base+ base(B)	BActual/BDesign.>1 then 1 Else if BA/BD<0.6 then 0; Else (BA/BD)

Strength(ST)	If Design STrength is 20 and actual ST>=15 then 1, Else 0; If Design STrength is 15 and actual ST>=11.25 then 1, Else 0;
Shoulder(S)	If Width>0.5m then 1, else 0
Drainage(D)	If present on >60 % length then 1, Else 0
Sign Board(SB)	1- If present, 0- Not Present

Score = 0.9*(L*W*T*B) + (0.1*(ST+S+D+SB)/4); Road fails if total score < 0.15

Road will fail if any of the following condition is not satisfied.

1. observed length is less than 80 % of design/MB
2. Width is less than 2.4 m
3. Concrete not observed on more than 70% length
4. Concrete thickness <40% of design
5. Strength

Designed	**Acceptable**
20 MPa	14.9 MPa (Rebound number 20)
15 MPa	11.25 MPa (Rebound number ..)

6. Layer thickness < 60 %

Mangalkaryalay/ Samajmandir

Check list for Mangalkaryalay/ Samajmandir

1. Area
2. Height
3. Flooring
4. Wall thickness
5. Number of door and window
6. Truss
7. Electrification
8. Paint
9. Plaster
10. Roof material

Steps to be followed for Mangalkaryalay/ Samajmandir inspection

1. Locate the structure and note down the GPS location. Use ODK app to collect the data.
2. Measure the external dimensions of structure.
3. Measure Plinth height from ground level and number of stairs/ramp. If ground level is sloping, measure average plinth height as suitable for the site.
4. Check whether the plaster and/or paint to the external walls is present or not. If present, give plaster and paint rating.
5. Measure external wall thicknesses
6. Measure number of rooms, dimensions (length, width & height) of individual room. Check the thickness and type of wall (internal) as per material used. Check flooring, skirting, plaster and paint. If present, check for its condition. Give flooring rating and plaster and paint rating.
7. Check the availability of **toilet**. If present, check its dimensions (length, width & height). Check the availability of ventilator, dado/skirting, flooring, WC pan and its condition.
8. Identify the type of roof (gable/gambrel/mansard/hipped/flat/shed), also check material used for roofing.
9. If flat roof is present in the form of concrete slab then carry out its visual inspection for concrete, also measure its thickness and determine strength using rebound hammer at suitable location.
10. If truss is present, identify its type and count the number, material used and its compliance as per drawings. Check its condition for coating and corrosion. Check purline, connections, welding.

11. Measure number of columns and beams along with alignments. If plastering is not present and concrete column is exposed, determine strength using rebound hammer at suitable locations.
12. Measure number of doors, windows and ventilators, and also identify type and material used and their condition.
13. Check the availability of water storage tank. If present, check material used, its capacity and condition. Also check condition of plumbing work for plumbing fixtures, plumbing fittings and pipe connections for the entire structure.
14. Check the availability of soak pit/septic tank and drainage facility along with dimensions.
15. Check the electrification work for wiring, electric meter and electrical fitting (bulbs, fans, tube lights, etc.) of whole structure.
16. Check for availability and condition of other facilities such as approach road, etc.

Format for field assessment

		Data		Assessment score
		Estimate	**Field measurements**	
External Dimensions: Length X Width (m)				Number
Height (m)				Number
Plinth height from ground (m)				
Stairs				Number
Wall				
External Wall	Thickness(mm)			Number
	Type			
Internal/ Partisan Wall	Thickness(mm)			
	Type			
Number of Rooms				
Room 1				
Length X Width X Height (m)				
Skirting				
Plaster and paint				
Internal Plaster			Condition	Number
External Plaster			Condition	
Internal Paint			Yes/No	
External Paint			Yes/NO	
WC condition				
Length x Width x Height (m)				Number
Urinal	Number			

	Condition			
WC	Number			
	Condition			
Roof and Truss				
Type of Roof				Number
Material of Roof				
Truss type				
Corrosion to truss				
Uniformly Welding				
		As Per Drawing:		
Structural Element				
Column	Vertical Alignment			Number
	Strength(mpa)			
Beam	Horizontal Alignment			
	Strength(Mpa)			
Doors And Windows				
Doors	No.			Number
	Material			
	Protective Coating			
Windows	No.			
	Material			
	Protective Coating			
Septic Tank/soak pit				Number
Drainage				Number
Water tank				Number
plumbing				Number

Other facilities		
Approach road		
Electricity		
Electric Fittings		
Electric Meter		
Signboard		

Observations from villagers	
No. of times used in an year:-	
Which community demanded for this building	
Has this work been done from any other scheme? When? If yes, which scheme? Also why was it taken under TBY again?	
Was Curing done at time of construction? By whom?	
Comments:	

Weightage

Items	Weight
Area(A)	Actual area/ Design; Restricted to a maximum of 1 (i.e should not be greater than 1)
Height(H)	Actual area/ Design; Restricted to a maximum of 1 (i.e should not be greater than 1)
Truss and roof(TR)	Truss Rating/5
Flooring(F)	Flooring rating/2
Plaster and Paint(PR)	Plaster Rating/3
Wall(W)	1- if provided; 0- if not provided.
Number of door and window(DW)	Actual/ Design
Number of Column and beam(CO)	If Actual CO / Design CO < 4 then 0 Else 1.
Ramp/Stair (R)	If present as per design then 1; else 0
Signboard(SB)	1 if present and 0 if not present

Score = (0.8*A*H*TR*DW*W*CO) + 0.2*(F+PR+R+SB)/4

Plaster and paint rating

Number	Condition
3	Plaster and paint is provided and minor cracks in plaster
2	Major crack in plaster and paint is provided
1	Plaster not provided and paint provided
0	Plaster and paint not provided

Flooring rating

Number	Condition
2	Flooring is in good condition and same material is used
1	Flooring is not in condition; or Flooring is good but change in material
0	Not provided

WC rating

Number	Condition
2	
1	

0	

Truss and Roof rating

Number	Condition of truss
5	Very Good
4	Gusset plate missing in truss, acceptable condition of roof.
3	Purlin not provided, minor connection problem, change in no of truss
2	Highly corrosion and connection (welding/bolted) problem.
1	Dismantle and roof very poor
0	Not provided

Smashanbhumi

Checklist

1. Area
2. Height
3. Flooring
4. Wall thickness
5. Truss
6. Paint
7. Plaster
8. Roof material
9. Chulla and Chabutara
10. Type of column and beam

Steps to be followed for Samashanbhumi inspection

1. Locate the structure and note down the GPS location.
2. Measure the external dimensions of structure.
3. Measure Plinth height from ground level and number of stairs/ ramp. If ground level is sloping, measure average plinth height as suitable for the site.
4. Measure number and respective dimensions of structural members (columns) along with its alignments.
5. In case of steel structural member (columns and beams), identify type of section used (C-section, I-section, other) Check availability of pedestal and base plate. Also check the adequacy of each connection (beam to column, column to base plate, pedestal to base plate, etc.)
6. Identify the type of roof (gable/gambrel/mansard/hipped/flat/shed) and also check material used for roofing.
7. Also check for type of connection (bolted and /or welded) and its condition.
8. Identify type and number of truss, material used and its compliance as per drawings. Check its condition for coating and corrosion. Also check for number of purlins and type of hooks (J, L, S, etc.)
9. Check the flooring dimensions and material used. Also check its condition.
10. Check availability and dimensions of Chulha and Chabutara along with its condition.
11. Check the thickness and type of wall (Brick masonry, Stone masonry, etc.) as per material used. Also check for availability and condition of plaster and paint on both internal and external side of enclosing walls.
12. Check for availability and condition of other facilities such as approach road, compound wall, gate, etc.

Format for field assessment

	Data		Assessment Score
	Estimate	**Field Measurement**	
Outside Dimensions			
Length x Width (m)			
Height			
Plinth Height(m)			
No. of Ramp			
Structural Element			
Number of Column.			**Number**
Column Type of Section- C/I			
Column Vertical Alignment			
Number of Beam			
Beam Type of Section- C/I			
Beam Horizontal Alignment			
Truss and roof			
Type of Roof			**Number**
Material of Roof			
Truss type			
No of truss			
Corrosion to truss			
Uniformly Welding			
	As per drawing:		
Chulha			**Number**
Length x Width x Height (m)			
Chabutara			**Number**
Length x Width x Height (m)			
Wall			
Thickness(mm)			
Type			
Plaster			
Internal			**Number**
External			
Paint			
Internal			
External			
Other facilities			
Approach Road			
Signboard			**Number**

Observations from villagers

Do people use this?	

Weightage

Items	Weight
Area(A)	Actual area/ Design
Height(H)	Actual area/ Design
Truss and roof(TR)	Truss Rating/5
Number of Column and beam(CO)	If Actual CO <4 then 0 Else 1
Flooring(F)	Flooring rating/2
Plaster and Paint(PR)	Plaster Rating/3
Wall(W)	1- if present; 0- if provided but not present
Chulla & Chabutara(CC)	1 if present and 0 if not present
Ramp/Stair (R)	If present as per design then 1; else 0
Signboard(SB)	1 if present and 0 if not present

Score = (0.8*A*H*TR*CO) + 0.2*(F*PR*R*W*CC*SB)/6

Truss and Roof rating

Number	**Condition of truss**
5	Very Good
4	Gusset plate missing in truss, acceptable condition of roof.
3	Purlin not provided, minor connection problems or roof missing parts,change in no of truss
2	Highly corroded and connection (welding/ bolted) problem or roof missing.
1	truss dismantled or missing parts
0	Not present

Flooring rating

Number	**Condition**
2	Flooring is in good condition and same material is used
1	Flooring is not in condition; or Flooring is good but change in material from estimate
0	Not present

Plaster and paint rating

Number	**Condition**
3	Plaster and paint is present and minor cracks in plaster
2	Major crack in plaster and paint is present
1	Plaster not provided and paint present
0	Plaster and paint not present but provided in estimate

Culvert

Check list for culvert

1. Number of pipes
2. Diameter
3. Length
4. Width
5. Wing wall
6. Blockage in pipe (silt, debris)
7. Settlement on ground

Steps to be followed for Culvert inspection

1. Locate the structure and note down the GPS location. Collect data using ODK
2. See the direction of flow. Note U/S side.
3. Measure length and width of the culvert. Note down type of culvert (pipe/box/slab). Verify that length of culvert is greater than stream width and height must be greater than maximum water level.
4. Measure the height of water above the bed level/below soffit and maximum height by water mark. Height must be greater than normal water level.
5. If culvert type is a pipe. Measure number of pipes, the length of pipe, diameter, alignment and material used. Else if culvert type is slab/box. Measure its length, width, and thickness and a number of boxes.
6. Measure length, width, and height of U/S and D/S head walls.
7. If wing wall is present, measure its dimensions length, width, height and note down material used. If apron is present, note down its condition and dimensions.
8. Check out other conditions such as skewness, settlement,
9. Note Scoring, blockage, apron damage, headwall damage at U/S and D/S. If blockage found, note down the reason
10. Measure the strength using rebound hammer at wing wall, head wall. Carry out test at minimum 8 points.

Format for field assessment

	Data		**Assessment score**
	Estimate	**Field measurement**	
Length(m)			Number
Width(m)			Number
Type of Culvert			
No of pipe			Number

Diameter of pipe(mm)			
Headwall			Number
(Length X Width X Height) m		(9.5 X 0.45X 0.6)	
Wing wall(If present)			Number
RHS 1st			
(Length X Width X Height) m			-
RHS 2nd			
(Length X Width X Height) m			-
LHS 1 st			
(Length X Width X Height) m			-
LHS 2 nd			
(Length X Width X Height) m			-
Strength of wing wall(MPa)			
Strength of Head wall(MPa)			
Signboard			Number

Condition of Culvert		
Scour at end of culvert	Upstream	
	Downstream	
Settlement	Yes/No	
Blockage (Debris/ Vegetation/ Silting)	Upstream	
Blockage (Debris/ Vegetation/ Silting)	Downstream	
Apron	Upstream	
	Downstream	
Headwall Damage	Upstream	
	Downstream	

Sign board	Present	Absent

Observations from villagers	
Is location proper	
Is location proper as per audit team	
Condition in rainfall	
Other locations on same road needing culvert	
Has this work been done from any other scheme? When? If yes, which scheme? Also why was it taken under TBY again?	
Was curing done	

Weightage

Parameter	Weightage
Length(L)	If length > Stream width then 1; Else 0
Width(W)	If WActual > 3 then 1; Else 0;
Pipe(P)	PActaul/PDesign > 1 then 1; Else if PA/PD < 60 % then 0 Else PA/PD
Head wall/ Height (H)	HActual/water level > then 1; Else 0
Wing wall(W)	WActual/WDesign < 0.6 then 0; Else 1
Settlement(SE)	0 – Settlement observed on surface 1 – No settlement
Blockage(BL)	0- if more than 60% of pipe is blocked by debris; Else 1
Head wall damage(HW)	If yes then 0;else 1
Sign Board(SB)	1- If present, 0- Not Present

Score = (0.8* L*W*P*H*W)+0.2*(SE+BL+SB+HW)/4

River protection Wall

Check list for river protection wall

1. Length
2. Width
3. Height
4. Strength

5. Location- can serve the purpose

Steps to be followed for river protection wall inspection

1. Locate the structure and note down the GPS location. Collect data using ODK
2. Note down number of river protection wall.
3. Note down the material used.
4. Measure length and height of each wall. Verify that height is greater than normal flood level (NFL).
5. Measure the top and bottom width of wall and find out its average width.
6. Note down diameter of weep hole and material used if provided.
7. Measure the strength using rebound hammer at head wall with the help of 8 sample points. Observe the overall condition of wall.

Format for field assessment

	Data		Assessment Score
	Estimate	**Field Measurement**	
Material			
Number of walls			
Length (m)			
Top Width (m)			
Bottom Width(m)			
Height(m)			
Foundation (Y/N)			
Weep hole (mm)			
Strength			
Wall damage			
Sign board			

Observations from villagers	
Excavated material disposed off	
Necessity	
Height of wall compared to normal flood level	

Weightage

Parameter	Weightage
Length(L)	If LActual/LDesign > 1 then 1;

	Else if LA/LD<0.7 then 0; Else (LA/LD)
Avg. Width(W)	If WActual/WDesign > 1 then 1; Else if WA/WD<0.7 then 0; Else (WA/WD)
Height (H)	HActual>NFL then 1 Else 0
Major Head wall damage(HW)	If yes then 0;else 1
Strength(S)	If Design STrength is 20 and actual ST>=15 then 1, Else 0; If Design STrength is 15 and actual ST>=11.25 then 1, Else 0;
Sign Board(SB)	1- If present, 0- Not Present

Score = 0.8*(L*W*H*S)+ 0.2* (HW+SB)/2

Well

Checklist

1. Total Depth of well
2. Inner Diameter
3. Parapet wall
4. Well platform
5. Lining
6. Weep hole

Steps to be followed for Well inspection

1. Locate the structure and note down the GPS location. Collect data using ODK
2. Measure the inner diameter of well.
3. Measure total depth of well till platform and if platform is not provided measure it to ground level.
4. Check lining is provided to well or not, if provided note down material and thickness of lining.
5. Note down diameter of weep hole and material used.
6. If stairs and soak pit is provided in estimate then note down their details. For stairs- material and condition. For Soak pit check out it is provided or not.
7. Observe if well platform is present, measure height of parapet wall from platform.

Format for field assessment

	Data		Assessment score
	Estimate	Field measurement	
Total depth(m)			
Diameter(m)			
Parapet wall(m)			
Platform			
Lining material			
Lining thickness			
Diameter of weep holes (mm)			
Pipe used for weep holes (mm)			

Soak pit			
Stairs			
Sign board			

Observations from villagers	
Water column depth	
Quality of water	
Distance from Gaothan	
Water availability month	
Approach road (Y/N)	

Weightage

Parameter	Weightage
Depth(D)	Actual Depth/ Design
Diameter(DI)	Actual Diameter/ Design
Parapet wall (PA)	Actual Parapet Wall/ Design
Platform(PL)	Actual Platform/ Design
Lining (L)	Actual Lining/ Design
Soak pit(SP)	If present as per design then 1; else 0
Stairs(SA)	If present as per design then 1; else 0
Sign Board(SB)	1- If present, 0- Not Present

Score = 0.9(D*DI*PA) + 0.1(PL+L+ SP +SB+SA)/5

Borewell/handpump

Checklist

1. For Pump
    a. Pump capacity
    b. Water availability
2. For Hand pump
    a. Hand pump
    b. Platform
    c. Water availability
    d. Soak pit

Steps to be followed for BoreWell inspection

1. Locate the structure and note down the GPS location. Collect data using ODK
2. For pump, find out capacity of pump and availability of water.
3. For hand pump, observe whether hand pump is provided or not also note down presence of water platform and soak pit.
4. With the help of villagers note down water availability month.

Format for field assessment

	Data		Assessment score
	Estimate	**Field measurement**	
Pump capacity/hand pump			
Platform			
Soak pit			
Water availability			
Sign board			

Observations from villagers		
Water available till		
Source is sustainable?		
Quality of water		
Alternative source		

Weightage

Items	Weight
Pump	
Platform (P)	Present -1,else 0
Water availability (WA)	Water available -1,else 0
Soak pit (SP)	Soak pit available-1, else 0
Signboard (SB)	1- If present, 0- Not Present

Score = 0.9 (WA) + 0.1 (P + SP + SB)/3

Public toilet

Check list

1. Area
2. Height
3. Urinal / WC
4. Septic tank/ soak pit
5. Flooring/ Dado and Wall thickness
6. Number of door and window/ventilator
7. Electrification
8. Paint and Plaster
9. Roof material
10. Water provision

Steps to be followed for Public toilet inspection

1. Locate the structure and note down the GPS location. Use ODK app to collect the data.
2. Measure Plinth height from ground level and number of stairs or ramp.
3. Measure the external dimension of structure.
4. Check whether the plaster and/or paint to the external walls is present or not. If present rate.
5. Identify the type of roof (gable/gambrel/mansard/hipped/flat/shed), also check material used for roofing.
6. Measure number of rooms, dimensions (length, width & height) of individual room. Check the thickness and type of wall (both internal and external) as per material used.
7. In room (boys/ girls). Measure the total number of urinal and WC present. Check its dimensions (length, width & height).Check the availability of ventilator, flooring, dado and WC pan and its condition.
8. Check the availability of soak pit/septic tank and drainage facility along with dimensions.
9. Measure number of columns and beams along with its alignments. If plastering is not present, also determine strength using rebound hammer at suitable location.
10. Check the electrification work for wiring, electric meter and electrical fitting (bulbs, fans, tube lights, etc.) of whole structure.
11. Check the availability of water storage tank. If present, check material used, its capacity and condition. Also check condition of plumbing work for plumbing fixtures, plumbing fittings and pipe connections for the entire structure.
12. If flat roof is present in the form of concrete slab then carry out its visual inspection for concrete visual distresses, also measure its thickness and determine strength using rebound hammer at suitable location.

13. Check for availability and condition of other facilities such as approach road etc.

Format for field assessment

		Data		Assessment score
		Estimate	**Field measurements**	
Outside Dimensions: Length x Width (m)				Number
Height (m)				Number
Plinth height from ground (m)				
No. of stair or ramp				
Wall				
External Wall	Thickness(mm)			Number
	Type			
Internal/ Partition Wall	Thickness(mm)			
	Type			
Number of Rooms				
WC condition				
Length x Width x Height (m)				Number
Urinal	Number			
	Condition			
WC	Number			
	Condition			
Plaster and paint				
Internal Plaster			Condition	Number
External Plaster			Condition	
Internal Paint			Yes/No	
External Paint			Yes/NO	
Roof				
Type of Roof				Number
Material of Roof				
Septic Tank/soak pit				Number
Drainage				Number
Water tank				Number
plumbing				
Structural Element				
Column	Vertical Alignment			Number
Beam	Horizontal Alignment			
Doors And Ventilator				
Doors	Number			Number
	Material			
	Protective Coating			

Ventilator	Number			
	Material			
	Protective Coating			
Signboard				Number

Others Details	
Hygienic	
Usable or not	
If not used, reason as per villagers	
Maintained or not	
Number of users	
Condition of drainage	
Condition of plumbing	

Weightage

Items	Weight
Area(A)	Actual area/ Design
Height(H)	Actual area/ Design
WC rating (WC)	
Roof(R)	Ruff rating/2
Flooring(F)	Flooring rating/2
Plaster and Paint(PR)	Plaster Rating/3
Number of Column and beam(CO)	If Actual CO / Design CO < 4 then 0 Else 1.
Number of door and window(DW)	Actual/ Design
Septic tank/soak pit (ST)	1 if provided and if not provided
Water Provision (WP)	1 if provided and if not provided
Drainage(DR)	
Ramp/Stair (R)	If present as per design then 1; else 0
Signboard(SB)	1 if present and 0 if not present

Score = (0.8*A*H*TR*DW*ST*WC*DR*CO) + 0.2*(F+PR+R+SB+WP)/5

Roof rating

Number	Condition of truss
2	Acceptable condition.
1	Holes, leackages
0	Not provided

Flooring rating (flooring and Dado)

Number	Condition

2	Flooring and Dado is in good condition and same material is used
1	Flooring is not in condition; or Dado is not provided in any rrom
0	Flooring and Dado provided

Plaster and paint rating

Number	Condition
3	Plaster and paint is provided and minor cracks in plaster
2	Major crack in plaster and paint is provided
1	Plaster not provided and paint provided
0	Plaster and paint not provided

WC rating

Number	Condition
2	
1	
0	

Drainage

	Internal
	Connection to septic tank
	Broken/blocked

Compound wall

Checklist

1. Length
2. Thickness
3. Material
4. Height
5. Number of columns
6. Gate

Steps to be followed for compound wall inspection

1. Locate the structure and note down the GPS location. Collect data using ODK
2. Measure total length of wall and other details like thickness, material and height.
3. Note down number of columns.
4. Note gates and their material and condition

Format for field assessment

	Data		Assessment score
	Estimate	**Field measurement**	
Total length(m)			
Thickness(mm)			
Height(m)			
Foundation			
Number of column			
Gate			
Sign board			

Weightage table

Items	Weight
Length(L)	If LActual/LDesign > 1 then 1; Else if LA/LD<0.8 then 0; Else (LA/LD)
Thickness(TH)	1 if as per design else 0
Height(H)	If H>2m then 1 Else 0.
Number of column(CO)	
Gate(G)	Rating/2

Signboard(SB)	1 if present and 0 if not present

Score=0.8 * (L*H*TH*CO) + 0.2 * (G+SB)/2

Gate rating

Weightage	Score
2	**Proper**
1	**Material/dimension**
0	**Not provided**

Concrete gutter

Checklist

1. Whether provided on one-side or both side of the road?
2. Type: rectangular/ trapezoidal/circular/semi-circular, etc.
3. Length
4. Width (rectangle), top width and bottom width (trapezoidal), diameter (circular & semi-circular)
5. Depth/ Height
6. Thickness of side wall/ head wall
7. Blockage in gutter (silt, debris, vegetation, etc.)
8. Over-flows during monsoon.

Steps to be followed for Concrete gutter inspection

1. Locate the structure and note down the GPS location. Collect data using ODK
2. Check whether the gutter is provided only on side or both side of the road.
3. Identify the type of gutter based on its shape i.e., rectangular, trapezoidal, circular, semi-circular, etc.
4. Measure length of the gutter.
5. Measure other parameters like:
    i. Rectangular: width and depth/height
    ii. Trapezoidal: top width, bottom width and depth/height
    iii. Circular & semi-circular: diameter
6. Measure the thickness of side/ head wall.
7. Measure the depth of water flowing in gutter. It should be less than the depth of gutter itself.
8. Check out other conditions such as silt, debris, vegetation blockage in the gutter. If gutter seems to be blocked , how much % seems to be usable?

9. Check for settlement, if any.
10. Measure the strength using rebound hammer at wing wall, head wall. Carry out test at minimum 8 points.

Format for field assessment

	Data		Assessment score
	Estimate	**Field measurement**	
Availability	One side/ both side	One side/ both side	
Type of gutter			Number
Length (m)			Number
Width /Diameter (m)			
Depth/ Diameter (m)			Number
Depth of water (m)			
Headwall/Sidewall			Number
(Length x Width/ thickness x Height) m			
Strength of Head wall/ Side wall (MPa)			
Signboard			Number

Condition of gutter	
Blockage (Debris/ Vegetation/ Silting/Construction Material)	Yes/No
Approximate Blockage percentage if due to construction material	……..%
Is slope available?	Yes/ No
Is level of gutter below road level?	Yes/ No
Is gutter usable?	Yes/ No

Observations from villagers	
Is location proper?	
Is location proper as per audit team?	
Condition in rainfall	
Other locations on same road needing gutter	
Has this work been done from any other scheme? When? If yes, which scheme? Also why was it taken under TBY again?	
Was curing done	

IRC SP:42 Guidelines for Road drainage (IRC SP:20)

Sr. No	Parameter	Standards
1	Location	300 mm deeper than the bottom of road crust
2	Minimum width at bottom	450 mm
3	Minimum longitudinal grade	0.5 per cent
4	Discharge	0.50 cum/sec
5	Shape	Triangular, Rectangular and Trapezoidal
6	Side slope	Generally not exceeding 1 in 4

Weightage

Parameter	Weightage
Length(L)	If LActual/LDesign > 1 then 1; Else if LA/LD<0.8 then 0;
Width(W)	WActual>=0.45m then 1;else 0
Depth (D)	DActual/DDesign.>1 then 1 Else if DA/DD<0.45 then 0;
Thickness of Headwall (T)	TActual/TDesign.>1 then 1 Else if TA/TD<0.8 then 0;
Slope Availability (SA)	Yes-1, No- 0
Gutter Level (GL)	Below road level-1,Above road level-0
Strength(ST)	If Design STrength is 20 and actual ST>=15 then 1, Else 0; If Design STrength is 15 and actual ST>=11.25 then 1, Else 0;
Blockage (B)	If blockage is due to construction material and greater than 40%- 0 If blockage is due to silting- 0
Usability (U)	Usable-1, Unusable-0
Sign Board(SB)	1- If present, 0- Not Present

Score = 0.8*(L*W*D*T) + (0.2*(SA+GL+ST+B+U+SB)/6)

Compound wall/ Boundary wall

a. The structure to be assessed is found and located with the help of available local people and liaison and its GPS location is recorded.
b. Total length of wall, top width, bottom width, height and material of wall should be checked. Number of columns provided should also be checked.
c. Number of columns, material and their condition should be observed
d. With the help of villagers, the information regarding the process of construction is also collected.
e. The images of all the data observed on field are also taken
f. The data observed on field is recorded in ODK collect mobile application.Compound wall/ Boundary wall

Analysis

This section discusses the various parameter of the Compound wall/ Boundary wall and corresponding weightage under specific conditions as given in Table 1**Error! Reference source not found.**

Table 1: Weightage of parameters of compound wall/ boundary wall

Sr. No.	Parameter	Weightage
1	Length (L)	If LActual/LDesign > 1 then 1; Else if LA/LD<0.8 then 0; Else (LA/LD)
2	Thickness (TH)	1 if as per design else 0
3	Height (H)	If H > 2m then 1 Else 0.
4	Gate (G)	Rating/2 > = 0.5
5	Sign Board (SB)	If present then 1, If not present then 0

The details of rating for gate based on its condition are given in Table 2

Table 2: Rating for gate

Sr. No.	Condition of gate	Rating
1	Proper	2
2	Material/dimension	1
3	Not provided	0

Score=0.8 * (L*H*TH) + 0.2 * (G+SB)/2

Pipe water supply