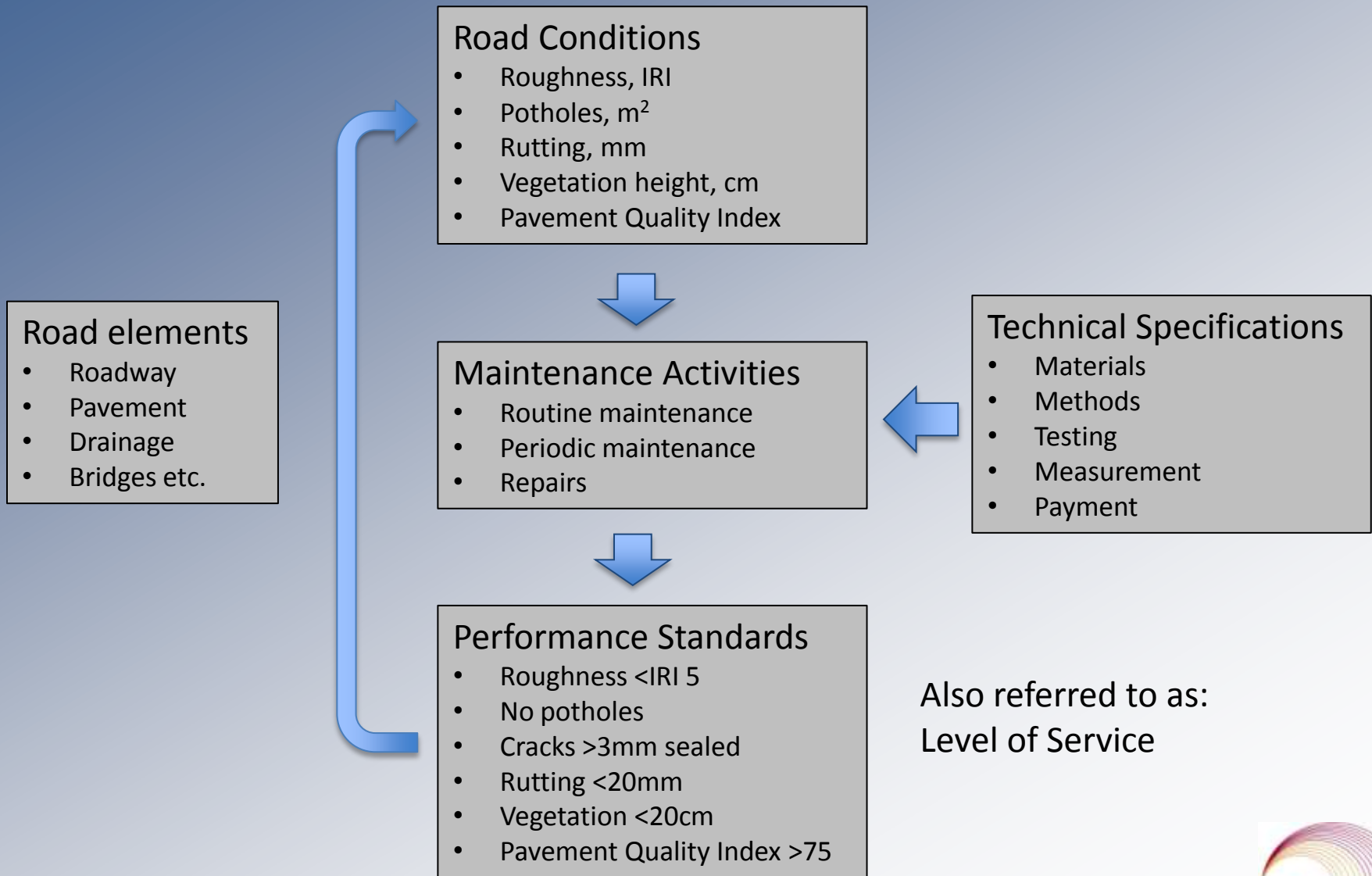


Session 3b: PBMC - What

- Maintenance works
- Scope of the contract
- Employer requirements
- Inspection and payment
- Performance standards
- Form of contract



Definitions



Also referred to as:
Level of Service

Maintenance Activities

Hybrid Contract - Bhutan

1	Performance-Based	Unit	Labour Gangs
1.1	Pavement Surface Cleanliness	km	X
1.2	Lined Side Drains Cleaning	m	X
1.3	Unlined Side Drains Cleaning	m	X
1.4	Culverts/Pipes Cleaning	no.	X
1.5	Roadside Vegetation Control	m	X
1.6	Minor Landslide Clearing	m ³	X
1.7	Whitewashing	m	X

3	Performance-Based After Initial Repairs	Unit	Mobile Gangs
3.1	Shoulder Maintenance	m ²	X
3.2	Parapets and Guardrails	no.	X
3.3	Road Signs & Distance Markers	no.	X
3.4	Road Markings	m	X
3.5	Bio-engineering	m ²	X
3.6	Bridge Maintenance	no.	X

2	Input Quantities-Based	Unit	Mobile Gangs	Construction Unit
2.1	Potholes and Patching	m ²	X	
2.2	Pavement Cracks	m ²		X
2.3	Pavement Edges	m		X
2.4	Pavement Surface Deficiencies	m ²		X
2.5	Pavement Deformations	m ²		X
2.6	WBM Pavement Maintenance	m ²	X	
2.7	Shoulder Drop-off	m ³		X
2.8	Shoulder Maintenance	m ²		X
2.9	Culvert/Pipes Repairs	no.	X	
2.10	Structures Cleaning and Repairs	m ²	X	
2.11	Parapets and Guardrails	no.	X	
2.12	Road Signs & Distance Markers	no.	X	
2.13	Pavement Markings	m	X	
2.14	Slope Restoration/Protection	m ³	X	
2.15	Bio-engineering	m ²		X
2.16	Bridge Maintenance	no.	X	
2.17	Major Landslide Clearance	m ³	X	
2.18	Snow Clearance	km	X	

Maintenance Activities

Yunnan, China

Road Elements	Minor Maintenance	Minor Repairs including Emergency Repairs	Medium Maintenance	Major Maintenance	Reconstruction
Roadbed	Routine Maintenance: Performance-Based	Routine Maintenance and Repairs including minor Emergency Repairs: Performance Based	Periodic Maintenance: Input Quantities	Rehabilitation: Input	Improvement
Pavement					
Bridges Culverts Tunnels					
Traffic Engineering					
Greening					

Maintenance Activities

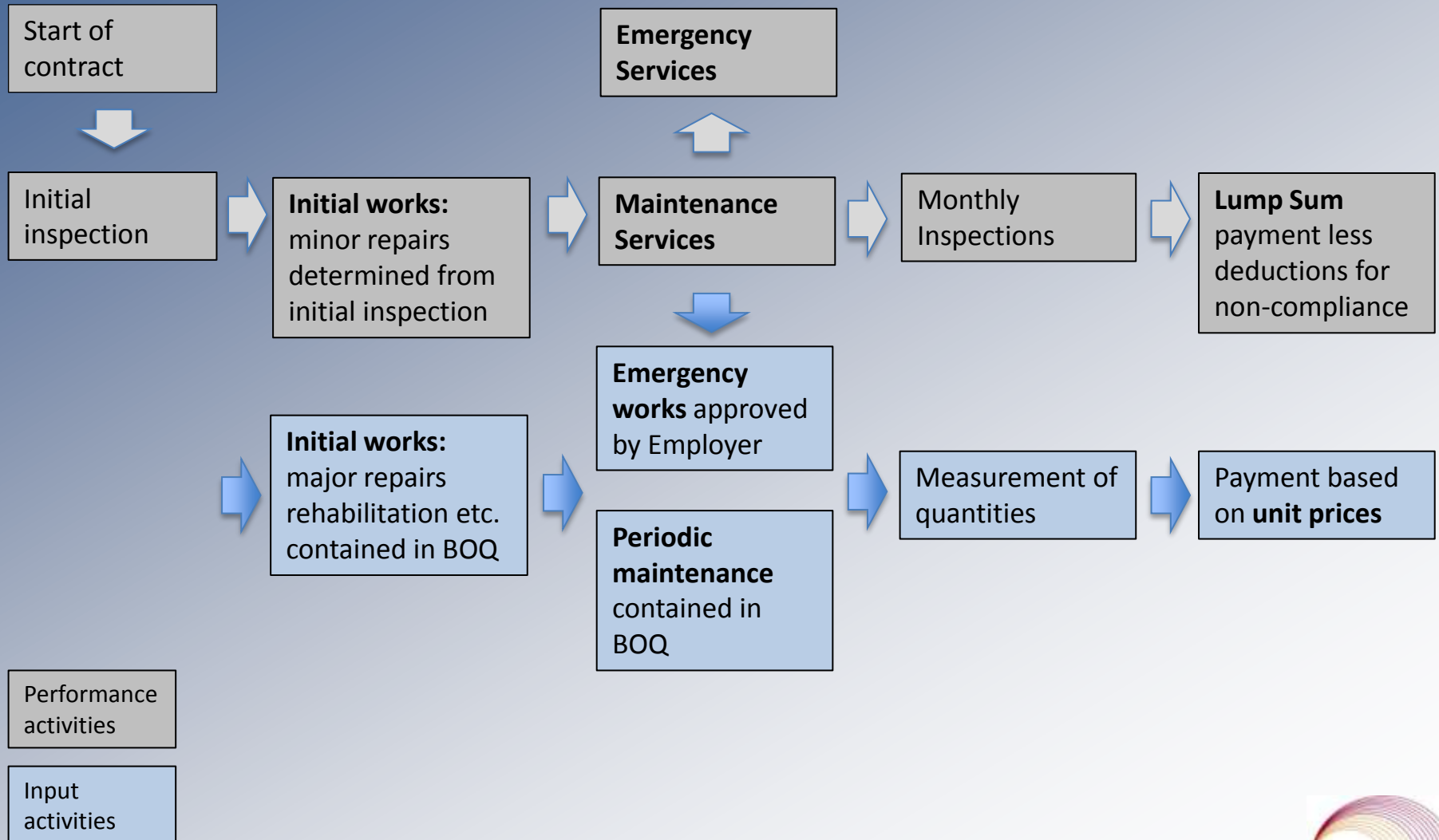
British Columbia, Canada

Category	Activities	Type of Maintenance	
Surface Maintenance	1-100 Pavement Patching 1-110 Surface Treatment 1-120 Crack Sealing	Routine Maintenance Services – Performance Based	
Drainage Maintenance	2-250 Ditch and Watercourse Maintenance 2-260 Drainage Appliance Maintenance		
Winter Maintenance	3-300 Patrol and Condition Reporting 3-310 Snow and Ice Removal		
Roadside	4-350 Roadside Vegetation Control 4-370 Litter and Graffiti Removal		
Traffic	5-440 Sign System Maintenance 5-450 Temporary Line Marking		Quantified Maintenance Services – Unit Prices
Structures	6-500 Bridge Deck Maintenance 6-520 Bridge Drain and Flume Maintenance		
Emergency	7-760 Flood Control and Washout Response 7-770 Mud, Earth and Rock Slide Response		
Inspections	8-830 Highway Patrol		

Scope of Works in Contract

Category	Performance or Input Based	Method of Payment
Major Initial Works: <ul style="list-style-type: none"> • Periodic maintenance • Rehabilitation or reconstruction • Improvement or upgrading • Major repairs 	Input quantities	Quantities (BOQ with unit prices)
Minor Initial Works: <ul style="list-style-type: none"> • Routine maintenance backlog 	Performance	Lump Sum
Maintenance Services	Performance	Lump Sum
Emergency Services <ul style="list-style-type: none"> • Minor as specified in contract • Above thresholds specified in contract 	Performance Input quantities	Lump Sum Quantities
Patrol and Inspection	Performance	Lump Sum
Traffic Management, Health, Environment	Performance	Lump Sum
Reporting	Performance	Lump Sum

Hybrid PBMC Process



Performance Standards

Right-of-Way and Road Formation

Defect Type	Allowance
Drains and ditches	<ul style="list-style-type: none">• No more than 10% of the cross section of a drain or ditch is obstructed at any location• Lined ditches do not have structural damage and are firmly contained by surrounding soil or material
Vegetation control	<ul style="list-style-type: none">• Height is <10cm within 5m of the edge of the pavement or side drain• No vegetation obstructs the view of road signs• No vegetation is located in structures or sealed surfaces• Vertical clearance of vegetation over the pavement is >6m
Retaining walls	<ul style="list-style-type: none">• Retaining walls are stable, without damage and weep holes are clear
Slopes and fences	<ul style="list-style-type: none">• Slopes are intact with no loose rocks and free of erosion• Fences are in good repair with no missing sections
Greening	<ul style="list-style-type: none">• Trees, flower beds are properly tended and fertilised and trees are whitewashed as needed

Performance Standards

Carriageway and Shoulders

Defect type	Allowance
Block/alligator cracks	<ul style="list-style-type: none"> No cracks >3mm wide Total area of cracks is $\leq 20\text{m}^2$ per 1km section
Longitudinal/transverse cracks	<ul style="list-style-type: none"> No unsealed cracks >3mm wide Total length of unsealed cracks $\leq 100\text{m}$ per 1km section
Potholes	<ul style="list-style-type: none"> No potholes >15cm diameter or >3cm depth Total number of potholes is ≤ 5 per 1km section
Ravelling	<ul style="list-style-type: none"> Total area of ravelling is $\leq 20\text{m}^2$ per 1km section
Rutting	<ul style="list-style-type: none"> No ruts >3cm deep Total length of rutting is $\leq 25\text{m}$ per 1km section
Depressions	<ul style="list-style-type: none"> No depressions >3cm depth Total area of depressions is $\leq 20\text{m}^2$ per 1km section
Shoving	<ul style="list-style-type: none"> No shoving >3cm height difference Total area of shoving $\leq 20\text{m}^2$ per 1km section
Bleeding	<ul style="list-style-type: none"> Total area of bleeding is $\leq 20\text{m}^2$ per 1km section
Edge break	<ul style="list-style-type: none"> No loose or breaking pavement edges Pavement width is at least 95% of design width as mentioned in contract
Shoulder	<ul style="list-style-type: none"> Shoulders not >3cm lower than pavement and shoulders not higher than pavement Maximum continuous length permitted with defects = 25m
Cleanliness	<ul style="list-style-type: none"> No soil, debris, trash, other objects or oil/chemical spills on pavement or shoulder

Performance Standards

Bridges, Culverts and Tunnels

Defect type	Allowance
Bridges	<ul style="list-style-type: none">• Guardrails are present and not deformed• All metal parts of the overall structure are painted or otherwise protected and free of corrosion• The bridge deck is clean and the deck material is fully intact and bolted down• The drainage system is in good condition and fully functional• Expansion joints are clean and in good condition• There are no obstacles to the free flow of water under the bridge and up to 100m upstream• The clearance under the bridge is according to design• There is no erosion around bridge abutments and piers
Culverts	<ul style="list-style-type: none">• No more than 10% of the cross section is obstructed at any location in the culvert• There is no structural damage and culverts are firmly contained by surrounding soil or material
Tunnels	<ul style="list-style-type: none">• Lighting, ventilation and emergency equipment are fully operational• The drainage system is in good condition and fully functional• Footpaths are clear of debris and in good repair• External structures are in good repair and clear of vegetation• Entrances are painted reflective paint and clearly visible at night

Performance Standards

Traffic Engineering

Defect type	Allowance
Signs	<ul style="list-style-type: none">• Information signs are present, complete, clean, legible, and structurally sound• Warning and traffic signs are present, complete, clean, legible, structurally sound and clearly visible at night
Horizontal demarcation	<ul style="list-style-type: none">• Horizontal demarcation is present, legible and firmly attached to pavement
Guardrails	<ul style="list-style-type: none">• Guardrails are present, clean, without structural damage• No guardrail sections are missing
Lighting	<ul style="list-style-type: none">• Lighting is functioning with no more than 5% of total lights unserviceable
Traffic signals	<ul style="list-style-type: none">• Traffic signals are functioning with no lights unserviceable
Kilometre posts	<ul style="list-style-type: none">• Kilometre and guidance posts are present, complete, clean, legible and structurally sound

Performance-Based Vs. Quantities-Based

Maintenance Category	Performance	Quantities
ROW and road formation Pavement and shoulders Protective works Drainage and water courses Signage, guardrail, other furniture Pavement markings	All routine maintenance and minor repairs	Major repairs
Bridges and tunnels (Often under separate maintenance contract)	Routine inspection and maintenance of pavement, drainage, joints, parapets, sidewalks, lighting	Major repairs and painting
Traffic signals and road lighting (Often under separate maintenance contract)	Routine inspection and maintenance	Upgrading of equipment or systems
Winter maintenance	All activities	Special weather events
Periodic maintenance Rehabilitation and reconstruction Upgrading and improvement	-	All works
Road patrol	All activities	-
Emergency repairs	All activities	Special weather events
Reporting	All activities	-

Types of PBMC

Length Man

- 1 to 1.5 km
- Vegetation, drain cleaning
- 1 year

Labour-based

- up to 100 km
- Vegetation, drain cleaning, whitewashing
- 1-3 years

Comprehensive

- Over 100 km
- All routine maintenance
- Major repairs, periodic maintenance, improvement works
- 3-10 years

Specialised

- Over 100 km
- Bridges, tunnels, traffic signals, lighting, pavement markings
- All routine maintenance
- Major repairs, improvement works
- 3-5 years

Duration of PMBC

Length man labour-based contracts

- 1-2 years
- No large investment except hand tools and personnel transport
- Encourages diligence and provides flexibility

Comprehensive contracts

- 3-10 years
- Enables Contractor to invest in equipment, facilities, personnel
- Provides learning period
- Encourages quality work to minimise deterioration
- Minimises Employer workload

Specialised contracts

- 3-5 years
- Enables Contractor to invest in equipment, facilities, personnel
- Provides learning period
- Facilitates technology changes

ADB SBD – Small Works

Section	Special Changes for PBCM
1. Instructions to Bidders (ITB)	No
2. Bid Data Sheet (BDS)	No
3. Evaluation and Qualification Criteria (EQC)	Yes
4. Bidding Forms (BDF)	Yes
5. Eligible Countries (ELC)	No
6. Works Requirements (WRQ)	Yes
7. General Conditions of Contract (GCC)	No
8. Particular Conditions of Contract (PCC)	Yes
9. Contract Forms (COF)	No

ADB SBD – Changes for PBCM

3. Evaluation and Qualification Criteria (EQC)	Evaluation may involve combination of technical and financial scoring
4. Bidding Forms (BDF)	BOQ will include: <ul style="list-style-type: none"> • Single Lump Sum price for performance-based activities • BOQ for specific works (major repairs, periodic maintenance, etc.) • Schedule of prices for supply of materials, labour, equipment (major emergency works, other works)
6. Works Requirements (WRQ)	General scope of works Specifications for: <ul style="list-style-type: none"> • Maintenance works (performance standards and penalties for defects) • Emergency works (threshold quantities for additional payment) • Other contractor requirements (quality, safety, environment, reporting) • Technical specifications for works and maintenance (country specific) • Drawings (if required for repair works etc.) • Supplementary information
8. Particular Conditions of Contract (PCC)	Modifications as needed, especially payment clauses for performance-based works

Scope of Works in Contract

Category	Performance Based (Lump Sum Payment Less Deductions for Non- Compliance)	Quantities Based (BOQ with unit prices)
Initial Works	Minor repairs	Major repairs Periodic maintenance Rehabilitation Improvement
Road Usability	Per performance standards	As specified in contract
Maintenance Services	Per performance standards	NA
Emergency Services	Per performance standards	As specified in contract
Patrol and Inspection	Per performance standards	NA
Quality, Traffic, Health, Environment Plans	Per performance standards	NA
Reports	Per performance standards	NA

Other Employer Requirements - 1

Maintenance Management Capacity	Personnel, computer systems and experience in management of road maintenance and construction works
Work Programme and Cash Flow Projections	Updated monthly
Self Control Unit	Special unit to monitor compliance with Employer's requirements
Inspection and Reports	Monthly inspections with Employer and Supervision Engineer to determine compliance Monthly road inspection report Other reports as specified by the Employer

Other Employer Requirements - 2

Quality Management Plan	Procedures for monitoring, planning, executing works and reporting in compliance with contract specifications
Traffic Management Plan	Control of vehicle and pedestrian traffic during works Comply with road agency traffic management manual
Emergency Procedures Plan	Procedures for responding to emergencies and road closures (road crashes, flooding, landslides, heavy snowfall)
Health and Safety Plan	Covers Contractor personnel and complies with country rules
Environmental Management Plan	Environmental mitigation measures complying with road agency and country rules

Payment Reduction for Defects - 1

Performance Standard	Payment Reduction
Pavement and Shoulders	
Block/alligator cracks	50%
Longitudinal/transverse cracks	50%
Potholes	50%
Ravelling	50%
Rutting	50%
Depressions	50%
Shoving	50%
Bleeding	50%
Edge breaks	50%
Cleanliness	10%
Shoulder	30%

Performance Standard	Payment Reduction
ROW	
Drains and ditches	30%
Vegetation control	20%
Retaining walls	10%
Slopes and fences	10%
Greening	10%
Bridges, Tunnels, Culverts	
Bridges	50%
Culverts	20%
Tunnels	50%
Road Furniture	
Signs	20%
Horizontal demarcation	20%
Guardrails	20%
Lighting	20%
Traffic signals	50%
Kilometre posts	10%

Payment Reductions for Defects - 2

Performance Standard	Payment Reduction
Other Requirements	
Road Usability	20% (of total road length)
Monthly Report, Work Programme and Cash Flow	5% (of total road length)
Compliance with Plans	5% (of total road length)
Environmental Management Plan	10%(of total road length)

Checklist

- Contract roads
- Estimate works and cost estimate
- Performance-based and quantities-based works
- Contract roads in reasonable condition overall
- Network of >100 km to attract qualified bidders
- Well-developed road construction industry with sufficient technical capacity
- Transparent procurement procedure to select best value
- Risk between Employer and Contractors balanced
- Bid prices may be much higher than estimated
- Sufficient funding for performance standards specified in the contract
- Pilot projects advisable to test procedures

Другие требования заказчика- 2

План управления качеством	Процедуры контроля, планирования, выполнения работ и отчетности в соответствии со спецификациями контракта
План управления движением	Контроль движения транспортных средств и пешеходов во время работ Соблюдение руководства по управлению движением дорожного органа
План аварийных процедур	Процедуры реагирования на чрезвычайные ситуации и закрытие дорог (дорожные аварии, наводнения, оползни, сильные снегопады)
План по безопасности и здоровью работников	Охватывает персонал подрядчика и учитывает законы страны
План управления экологической ситуацией	Меры по экологическому смягчению соответствующий правилам дорожного органа и страны

Вычеты из оплат за дефекты- 1

Стандарты тех характеристик	Вычеты из оплат
Тротуары и обочины	
Блокирование/ шлифовочные трещины	50%
Продольная / поперечная трещины	50%
Ямы	50%
Расслоение асфальтового покрытия	50%
Выбоины	50%
Углубления	50%
Ухабы	50%
Отводы	50%
Обрыв краев	50%
Чистота	10%
Обочины	30%

Стандарты тех характеристик	Вычеты из оплат
Право проезда	
Стоки и канавы	30%
Контроль за растительностью	20%
Подпорные стены	10%
Склоны и заборы	10%
Озеленение	10%
Мосты, эстакады, тоннели	
Мосты	50%
Эстакады	20%
Тоннели	50%
Дорожная фурнитура	
Знаки	20%
Горизонтальная демаркация	20%
Защитные ограждения	20%
Освещение	20%
Светофоры	50%
Указатели километража	10%

Вычеты из оплат за дефекты- 2

Стандарты тех характеристик	Вычеты из оплат
Другие требования	
Эксплуатационная пригодность дороги	20% (от общей длины дороги)
Месячный отчет, программа работ и денежный поток	5% (от общей длины дороги)
Соответствие планам	5% (от общей длины дороги)
План управления экологической ситуацией	10%(от общей длины дороги)

Контрольный список

- Дороги по контракту
- Смета работ и расходов
- Работы в рамках контракта ориентированного на результаты и ориентированных на количество
- Вся дорога по контракту в допустимых условиях
- Сеть дороги >100 км для привлечения квалифицированных участников торгов
- Хорошо развитая дорожно-строительная отрасль с достаточными техническими возможностями
- Прозрачные процедуры закупок, для отбора лучшей цены
- Баланс риска между заказчиком и подрядчиком
- Цена тендерных предложений может быть гораздо выше, чем предполагалось
- Достаточное финансирование для выполнения стандартов, указанных в контракте
- Пилотные проекты для тестирования процедур