

# परिशिष्ट—2

(खण्ड— I से खण्ड— VII)



# खण्ड-I

ग्रामीण टोला सम्पर्क निश्चय योजना  
(GTSNY)



## 1. भूमिका

राज्य के ग्रामीण बसावटों को एकल बारहमासी सम्पर्कता प्रदान करने के लिए राज्य में दो मुख्य योजनाएँ लागू हैं। प्रथम योजना प्रधानमंत्री ग्राम सड़क योजना है, जो पूर्व में शत-प्रतिशत और वर्ष 2015-16 से 60:40 के अनुपात में केन्द्र प्रायोजित है। इसके तहत राज्य के 11 IAP जिले, यथा गया, रोहतास, कैमूर, औरंगाबाद, अरवल, जहानाबाद, पश्चिम चम्पारण, जमुई, मुंगेर, नवादा तथा सीतामढ़ी में 250 या उससे अधिक आबादी वाले बसावटों को तथा शेष 27 गैर IAP जिलों में 500 या उससे अधिक आबादी वाले बसावटों को एकल सम्पर्कता प्रदान की जाती है। IAP तथा गैर IAP जिलों के बीच इस विषमता को समाप्त करने के लिए राज्य सरकार ने अपनी निधि से 27 गैर IAP जिलों में मुख्यमंत्री ग्राम सम्पर्क योजना लागू की है, जिसके तहत 250-499 तक की आबादी वाले बसावटों को एकल सम्पर्कता प्रदान की जाती है।

प्रधानमंत्री ग्राम सड़क योजना के क्रियान्वयन करने के लिए राष्ट्रीय बसावट सर्वेक्षण, 2003 के आधार पर वर्ष 2012 में कोर-नेटवर्क तैयार किया गया था, जिसमें कुल बसावटों की संख्या 1,03,591 है। पुनः वर्ष 2012-13 के पूर्व लागू मुख्यमंत्री ग्राम सड़क योजना तथा वर्ष 2013-14 से लागू मुख्यमंत्री ग्राम सम्पर्क योजना एवं राज्य निधि से लागू की गई अन्य योजनाओं के क्रियान्वयन के लिए वर्ष 2012 में राज्य कोर-नेटवर्क क्रमशः Comprehensive New Connectivity Priority List (CNCPL) तथा Comprehensive Upgradation Priority List (CUPL) तैयार किया गया, जिसमें कुल बसावटों की संख्या 1,08,591 है।

ऐसा पाया गया है कि पूर्व में तैयार किए गए दोनों प्रकार के नेटवर्क में ऐसे कई बसावट तथा टोले छूट गए हैं, जिनकी आबादी 100 या उससे अधिक है। इनमें से अधिकांश टोले/बसावट आर्थिक एवं सामाजिक दृष्टिकोण से पिछड़े वर्गों एवं अनुसूचित जातियों की बहुलता वाले हैं।

उपरोक्त परपिक्ष्य में राज्य सरकार ने यह निर्णय लिया है कि वैसे सभी अचिह्नित तथा अनजुड़े टोलें/बसावटों, जिनकी आबादी 100 या उससे अधिक है, को उपग्रह मानचित्र के आधार पर चिह्नित कर तथा उनका स्थल सर्वेक्षण/सत्यापन कर पूरक राज्य कोर-नेटवर्क तैयार किया जाए, जो पूर्व में तैयार किए गए CNCPL तथा CUPL के सदृश होंगे तथा एक नई योजना का सृजन कर इन अचिह्नित अनजुड़े बसावटों को एकल बारहमासी सम्पर्कता प्रदान की जाए जसि "ग्रामीण टोला

सम्पर्क निश्चय योजना" के अंतर्गत सभी जिलों में पथों का निर्माण चरणबद्ध ढंग से अगले पाँच वर्षों में किया जाएगा।

"ग्रामीण टोला सम्पर्क निश्चय योजना" के अंतर्गत वित्तीय वर्ष 2016-17 से 100 या अधिक आबादी वाले अचिह्नित अनजुड़े टोलों/बसावटों को बारहमासी एकल सम्पर्कता प्रदान करने का प्रस्ताव है।

# खण्ड-II

पूरक राज्य कोर नेटवर्क एवं  
बसावट का परिभाषा





## 2. पूरक राज्य कोर नेटवर्क

प्रधानमंत्री ग्राम सड़क योजना के क्रियान्वयन करने के लिए राष्ट्रीय कोर-नेटवर्क तथा मुख्यमंत्री ग्राम सम्पर्क योजना एवं राज्य निधि से लागू की गई अन्य योजनाओं के क्रियान्वयन के लिए राज्य कोर-नेटवर्क में वैसी बसावटें जो किसी कारणवश छूट गयी हो, इस योजना में सम्मिलित किया जाएगा।

ऐसे सभी अचिह्नित तथा अनजुड़े टोलें/बसावटों, जिनकी आबादी 100 या उससे अधिक है, को उपग्रह मानचित्र के आधार पर चिह्नित कर तथा उनका स्थल सर्वेक्षण/सत्यापन कर पूरक राज्य कोर-नेटवर्क तैयार किया गया, जो पूर्व में तैयार किए गए CNCPL तथा CUPL के सदृश है।

## 3. बसावट

एक जगह रहनेवाली जनसंख्या के समूह, जो लम्बे समय तक स्थान नहीं बदलते हैं, को बसावट कहते हैं।

संलग्न परिशिष्ट-1 खण्ड-V के कॉलम-5 में बसावटों का नाम दिया गया है तथा कॉलम-9 तक में पथों का नाम अंकित है।



# खण्ड–III

दिशा–निर्देश



#### 4. उद्देश्य

इस योजना के अंतर्गत वित्तीय वर्ष 2016-17 से 100 या अधिक आबादी वाले अचिह्नित अनजुड़े टोलों/बसावटों को बारहमासी एकल सम्पर्कता प्रदान करने के लिए सभी जिलों में पथों का निर्माण चरणबद्ध ढंग से अगले पाँच वर्षों में किया जाएगा।

#### 5. परिभाषा

निम्नलिखित शब्दों की परिभाषा मुख्यमंत्री ग्राम संपर्क योजना के अंतर्गत दी गयी परिभाषा के सदृश है जो की निम्न प्रकार है।

5.1 **बसावट**—एक जगह रहनेवाली जनसंख्या के समूह, जो लम्बे समय तक स्थान नहीं बदलते हैं, को बसावट कहते हैं।

5.2 **कोर-नेटवर्क**—यह सड़कों का ऐसा अल्प नेटवर्क है, जो कम से कम एक खास क्षेत्र में सभी पात्रता प्राप्त बसावटों को एक सड़क से जोड़ता है।

5.3 **थ्रू रूटस्**— वैसी सड़कें जो कई सम्पर्क पथों को जोड़ती है एव उच्च श्रेणी की सड़कों के माध्यम से विपणन केन्द्रों से जुड़े होते हैं।

5.4 **लिंक रूटस्** — वैसी सड़कें जो एक बसावट या बसावटों के एक समूह को थ्रू रूटस् से जोड़ती है।

5.5 **निश्चय रूटस्** — बारहमासी एकल सम्पर्कता प्रदान करने वाले सड़कें जो की 100 या अधिक वाले अचिह्नित अनजुड़े टोलों/बसावटों को “ग्रामीण टोलासम्पर्क निश्चय योजना” के अंतर्गत सम्पर्कता प्रदान करती है।

राज्य कोर-नेटवर्क में प्रस्तावित पथों के लिए 'निश्चय' शब्द का प्रयोग किया गया है। वास्तव में यह लिंक रूट ही है जो सामान्यतः अचिह्नित अनजुड़े टोलों/बसावटों की अन्तिम सीमा तक जाती है।

#### 6. मार्गदर्शक सिद्धांत

“ग्रामीण टोला सम्पर्क निश्चय योजना” के चयन हेतु कार्यकारी प्रावधान निम्नवत होंगे:—

(क) **100 या उससे अधिक** आबादी वाले अनजुड़े टोलों/बसावटों को बारहमासी एकल सम्पर्कता प्रदान की जाएगी जिसकी सूची परिशिष्ट-1 में संलग्न है।

(ख) प्रधानमंत्री ग्राम सड़क योजना के क्रियान्वयन करने के लिए राष्ट्रीय कोर-नेटवर्क तथा

मुख्यमंत्री ग्राम सम्पर्क योजना एवं राज्य निधि से लागू की गई अन्य योजनाओं के क्रियान्वयन के लिए राज्य कोर-नेटवर्क में वैसी बसावटें जो किसी कारणवश छूट गयी हो, इस योजना में सम्मिलित किया जाएगा।

(ग) राज्य कोर-नेटवर्क में प्रखंडवार प्रस्तावित पथों की प्राथमिकता सूची, योजना के चयन का आधार होगा। प्राथमिकता सूची निर्धारित करने का आधार निम्नवत् होंगे –

1. Priority 1 : विधानमंडल के माननीय सदस्यों की अनुशंसा के आधार पर।
2. Priority 2 : बसावटों के आबादी के आधार पर।
3. Priority 3 : भूमि उपलब्धता के आधार पर।

प्रत्येक जिला में प्रभारी मंत्री की अध्यक्षता में “ ग्रामीण टोला सम्पर्क निश्चय योजना अनुश्रवण समिति” गठित की जाएगी। प्रशासी विभाग इससे संबंधित अनुदेश निर्गत करेगा।

## 7. राशि की उपलब्धता

- 7.1 योजना का कार्यान्वयन राज्य सरकार अपने बजट से प्राप्त राशि एवं वाह्य स्रोतों से करेगी।
- 7.2 ग्रामीण कार्य विभाग इस राशि को Grant-in-Aid के रूप में पूर्व से गठित बिहार ग्रामीण पथ विकास अभिकरण (BRRDA) को उपलब्ध कराएगा।
- 7.3 इसके लिए बिहार ग्रामीण पथ विकास अभिकरण (BRRDA) द्वारा एक अलग बैंक खाता खोला जाएगा, जिसमें उपलब्ध करायी गयी राशि रखी जाएगी। सचिव, ग्रामीण पथ विकास अभिकरण की अनुशंसा पर सभी संबंधित कार्यपालक अभियंता का खाता राज्यस्तरीय बैंक में खोला जाएगा। बैंक द्वारा उन्हें चेक बुक उपलब्ध कराया जाएगा। ब्रांडा, राशि की निकासी हेतु आवश्यकतानुसार सभी कार्य प्रमंडलों को प्राधिकार पत्र निर्गत करेगा।

## 8. राशि का कर्णाकण

- 8.1 प्रखंड के लिए राशि का कर्णाकण पूरक राज्य कोर-नेटवर्क में प्रस्तावित पथों की प्राथमिकता सूची के आधार पर राज्य एवं प्रखंड की कुल लम्बाई के समानुपात में किया जाएगा।
- 8.2 योजना का कार्यान्वयन विभाग के कार्य प्रमंडलों के द्वारा किया जाएगा।
- 8.3 बजटीय राशि का 2.25 प्रतिशत राशि प्रशासनिक व्यय हेतु सुरक्षित रहेगा, जिसका उपयोग निम्नवत् होगा –

- (क) कार्य प्रमंडलों के प्रशासनिक व्यय हेतु – 1%
- (ख) यात्रा व्यय के लिए – 0.50%
- (ग) मुख्यालय के प्रबंध एवं यात्रा व्यय हेतु – 0.25%
- (घ) स्वतंत्र गुणवत्ता अनुश्रवण (द्वितीय एवं तृतीय स्तर) हेतु –0.50%

## 9. विस्तृत प्राक्कलन

- 9.1 विभाग के कार्य प्रमंडलों के द्वारा तैयार किया जाएगा।
- 9.2 चयनित पथों के निर्माण हेतु योजनाओं का विस्तृत प्राक्कलन निर्धारित विशिष्टियों एवं मानकों के अनुसार किया जाएगा।
- 9.3 स्थल निरीक्षण के आधार पर जहाँ कहीं भी पुल/पुलियों की आवश्यकता हो, का प्रावधान प्राक्कलन में किया जाएगा।
- 9.4 योजना संबंधी सूचना पट (Retro Reflective) का प्रावधान किया जाएगा।
- 9.5 अनुसूचित दर विभाग द्वारा प्रतिवर्ष प्रकाशित की जाएगी, यदि यह विभाग द्वारा प्रकाशित नहीं हो पाता है, तो आर0सी0डी0 द्वारा प्रकाशित अनुसूचित दर मान्य होगा।
- 9.6 कार्यपालक अभियंता एवं अधीक्षण अभियंता प्राक्कलन की शुद्धता (Correctness) की जाँच कर अपनी अनुशंसा के साथ प्राक्कलन संबंधित मुख्य अभियंता को उपलब्ध करायेंगे।
- 9.7 मुख्य अभियंता तकनीकी अनुमोदनोपरांत प्रशासनिक स्वीकृति हेतु प्राक्कलन ब्राडा कार्यालय को उपलब्ध करा देंगे।

## 10. तकनीकी एवं प्रशासनिक स्वीकृति

- 10.1 मुख्य अभियंता तकनीकी अनुमोदन के क्रम में अन्य बातों के अतिरिक्त निम्नलिखित जाँच कर लेंगे :-
  - (i) प्रस्तावित पथ का प्राक्कलन अनजुड़े बसावटों को एकल सम्पर्कता प्रदान करने हेतु तैयार की गयी है, का प्रमाण-पत्र।
  - (ii) भूमि उपलब्धता का प्रमाण-पत्र।
  - (iii) सर्वेक्षण भ्रमण (Transact walk) की प्रक्रिया अपनायी गयी है।
  - (iv) प्राथमिकता सूची के लिए अभिपुष्टि।
  - (V) प्रस्तावित पथ किसी अन्य योजना के तहत स्वीकृत नहीं होने संबंधी प्रमाण-पत्र।

(vi) दिशा-निदेश के अनुसार पंचवर्षीय सड़क अनुरक्षण का प्राक्कलन संलग्न की गयी है।

10.2 प्रशासी विभाग समय-समय पर इससे संबंधित विस्तृत अनुदेश निर्गत करेगा। विस्तृत प्राक्कलन पर बिहार लोक निर्माण संहिता में निहित प्रावधानों एवं तत्संबंधी अन्य सरकारी निदेशों के अनुरूप विभागीय स्तर पर प्रधानमंत्री ग्राम सड़क योजना के तर्ज पर प्रशासनिक एवं तकनीकी स्वीकृति प्राप्त की जाएगी।

## 11. निविदा प्रक्रिया

11.1 परियोजना प्रस्तावों की स्वीकृति एवं तकनीकी स्वीकृति प्राप्त होने के पश्चात् मुख्यालय/कार्यपालक अभियंता द्वारा एस०बी०डी० आधारित ई-टेंडरिंग के माध्यम से निविदा आमंत्रित की जाएगी।

11.2 निविदाओं के लिए राज्य सरकार द्वारा अनुमोदित Standard Bidding Document को अपनाया जाएगा एवं सभी परियोजनाओं के लिए प्रतिस्पर्धी दर के आधार पर निविदा हेतु सुव्यवस्थित प्रक्रिया अपनायी जाएगी।

11.3 **ग्रामीण टोला सम्पर्क निश्चय योजना** में गुणवत्ता के साथ-साथ समय पर कार्य को पूर्ण करने वाले संवेदकों को प्रोत्साहित किया जाएगा। काली सूची में डाले गये संवेदकों की अद्यतन सूची विभागीय वेबसाईट [www.rwd.bih.nic.in](http://www.rwd.bih.nic.in) पर डाला जाएगा एवं इसे समय-समय पर update किया जाएगा।

11.4 तकनीकी बीड का मूल्यांकन कर सफल निविदाकारों के वित्तीय बीड का निष्पादन विभाग द्वारा निर्धारित समय के अंदर सम्पन्न किया जाएगा।

## 12. कार्यान्वयन

12.1 योजना का कार्यान्वयन कार्य प्रमंडलों के द्वारा कराया जाएगा।

12.2 प्रत्येक कार्य के लिए संवेदक से Work programme प्राप्त किया जाएगा, जिसे कार्यपालक अभियंता से अनुमोदित कराया जाएगा एवं तदनुसार कार्य को पूरा करना संवेदक की जिम्मेवारी मानी जाएगी।

12.3 कार्यदेश जारी करने की तिथि से कार्य पूर्ण करने की अवधि निम्नवत् होगी (क) 10 करोड़ तक की योजना के लिए समय-12 माह।



- 12.4 निविदा आमंत्रण सूचना में दी गयी समयावधि एवं संवेदक से प्राप्त Work Programme को कड़ाई से लागू किया जाएगा। चूँकि समय सीमा ही Contract का मूल आधार है। अतः विलम्ब होने की स्थिति में संवेदक के खिलाफ अनुबंध के प्रावधानों के अनुसार कार्रवाई की जाएगी।
- 12.5 कार्यादेश निर्गत होने के 15 दिनों के भीतर कार्य स्थल पर संवेदक द्वारा Logo के साथ साईन बोर्ड लगाया जाएगा। इस साईन बोर्ड पर कार्यक्रम का नाम, पथ का नाम, पथ की लम्बाई, निर्माण कार्य की लागत, कार्य प्रारंभ की तिथि, कार्य समाप्ति की तिथि, पाँच वर्षों तक सड़क के रख-रखाव की राशि एवं संवेदक का नाम अंकित होगा साथ ही नीचे दायी तरफ कार्य प्रमंडल का नाम लिखा जाएगा।
- 12.6 योजना में सड़क निर्माण हेतु आवश्यकतानुसार भूमि-अधिग्रहण/भूमि लीज का भी प्रावधान किया जाएगा, किन्तु जिन पथों के लिए पूर्व से भूमि उपलब्ध होगी उन्हें निर्माण कार्य में प्राथमिकता दी जाएगी।
- 12.7 प्रत्येक कार्य प्रमंडलों/मुख्यालय के लिये आउटसोर्सिंग के आधार पर लेखा संधारण करने वाले विशेषज्ञ/चार्टर्ड एकाउन्टेन्ट की सेवायें प्राप्त की जाएगी। वे प्रत्येक माह प्रमंडल के अभिलेखों की जाँच करेंगे। लेखा संधारण करने वाले विशेषज्ञ/चार्टर्ड एकाउन्टेन्ट के लिए विभाग द्वारा निर्धारित मानदेय का भुगतान किया जाएगा। प्रशासी विभाग समय-समय पर इससे संबंधित विस्तृत अनुदेश निर्गत करेगा।
- 12.8 **ग्रामीण टोला सम्पर्क निश्चय योजना** कार्यक्रम के सुचारू क्रियान्वयन हेतु बिहार ग्रामीण पथ विकास अभिकरण (BRRDA) का आवश्यकतानुसार सुदृढीकरण किया जाएगा। विशेषकर रिक्त पदों को प्रतिनियुक्ति/संविदा/आउटसोर्सिंग के आधार पर भरने की कार्रवाई की जाएगी।
- 12.8 आउटसोर्सिंग के आधार पर गुणवत्ता अनुश्रवकों/अंकेक्षकों/व्यवसायिक फर्मों/Consultants/विशेषज्ञों आदि का पैनल गठित करने तथा इन्हें भुगतान की जाने वाली राशि के निर्धारण हेतु विभागीय सचिव की अध्यक्षता में एक समिति गठित की जाएगी।

### 13. अनुश्रवण

- 13.1 कार्यपालक अभियंता प्रत्येक माह अन्य बातों के अतिरिक्त सहायक अभियंता, कनीय अभियंता

एवं संवेदकों के साथ बैठक कर योजनावार समीक्षा करेंगे, साथ ही गुणवत्ता के साथ ससमय कार्य को पूरा कराने की कार्रवाई करेंगे।

- 13.2 अधीक्षण अभियंता प्रत्येक माह अपने प्रक्षेत्र अंतर्गत सभी कार्यपालक अभियंताओं एवं संवेदकों के साथ योजनावार समीक्षा करेंगे एवं कार्य योजना से पीछे चल रही योजनाओं से संबंधित संवेदकों की बैठक आहूत कर आवश्यक दिशा-निर्देश देंगे।
- 13.3 मुख्य अभियंता प्रत्येक माह अपने प्रक्षेत्र अंतर्गत सभी अधीक्षण अभियंता एवं सभी कार्यपालक अभियंताओं के साथ समीक्षा बैठक करेंगे एवं आवश्यक दिशा-निर्देश देंगे।
- 13.4 विभागीय सचिव की अध्यक्षता में अभियंता प्रमुख, सभी मुख्य अभियंता सभी अधीक्षण अभियंता एवं सभी कार्यपालक अभियंताओं के साथ समीक्षा बैठक करेंगे एवं आवश्यक निदेश दिये जायेंगे।
- 13.5 विभाग के सभी अभियंताओं के साथ CUG मोबाईल, Tablet PC एवं Video Conferencing के माध्यम से भी योजनाओं का अनुश्रवण कर आवश्यक दिशा-निदेश दिये जायेंगे।

#### **14. गुणवत्ता नियंत्रण एवं पर्यवेक्षण**

- 14.1 कार्यो की गुणवत्ता सुनिश्चित करने की जिम्मेवारी कार्य प्रमंडलों की होगी। इसके लिए सभी कार्यो के प्रभावी ढंग से पर्यवेक्षण किया जाएगा एवं कराये गये कार्यो का भुगतान गुणवत्ता जाँच फल के गुण-दोष के आधार पर ही किया जाएगा।
- 14.2 पथों की गुणवत्ता सुनिश्चित करने के लिए राज्य स्तर पर सरकारी/गैरसरकारी/सेवानिवृत्त अभियंताओं/संस्थाओं का पैनल या आउटसोर्सिंग के आधार पर तैयार किया जाएगा, जो नियमित अन्तराल पर पथों के निर्माण कार्य की जाँच करेंगे।
- 14.3 पथों से लिए गए नमूनों की जाँच ग्रा0का0वि0 के प्रमंडलीय प्रयोगशाला/क्षेत्रीय प्रयोगशाला के साथ-साथ अभियंत्रण महाविद्यालयों एवं विभाग के अनुमोदन से अन्य प्रतिष्ठित जाँच प्रयोगशालाओं में भी करायी जा सकेगी।
- 14.4 पथों के निरीक्षण एवं गुणवत्ता सुनिश्चित करने के लिए आधारभूत संरचना का सुदृढीकरण किया जाएगा।
- 14.5 **ग्रामीण टोला सम्पर्क निश्चय योजना** के अन्तर्गत त्रिस्तरीय (Three tier) गुणवत्ता

नियंत्रण का प्रावधान निम्नवत् रहेगा

1. प्रथम स्तर—संवेदक द्वारा प्रत्येक पथ के लिए गुणवत्ता नियंत्रण प्रयोगशाला स्थापित किया जाएगा। संवेदक/ग्रा0का0वि0 कार्य प्रमंडल के द्वारा निर्माण के क्रम में समुचित संख्या में आवश्यक जाँच की जाएगी एवं संवेदक द्वारा गुणवत्ता नियंत्रण पंजी (Quality Control Register) का संधारण किया जाएगा।
  2. द्वितीय स्तर—PIU में पदस्थापित स्वतंत्र अभियंता (Independent Engineer) के द्वारा कार्यों की नियमित जाँच की जाएगी एवं जाँचफल प्रतिवेदन मुख्यालय/ कार्य प्रमंडल को अगले दिन तक निश्चित रूप से उपलब्ध कराया जाएगा।
  3. Third Tier: निरीक्षण के तीसरे स्तर पर Principal Quality Monitor (PQM) होंगे, जो सामान्यतः राज्य/केन्द्रीय संगठनों के सेवानिवृत्त, वरीय अभियंता होंगे।
- 14.6 कार्य प्रमंडलों द्वारा उपलब्ध कराये गये (Action Taken Report) प्रतिवेदन की समीक्षा मुख्यालय स्तर पर की जाएगी एवं उपलब्ध कराये गये साक्ष्य प्रतिवेदन यथा सत्यापित फोटोग्राफ्स, जाँच फल आदि एवं आवश्यकता पड़ने पर स्थल निरीक्षण के आधार पर मुख्यालय स्तर पर गठित कमिटी द्वारा पथों को संतोषजनक श्रेणी में (Regrade to Satisfactory) किया जाएगा।

## 15. लेखा

- 15.1 कार्य प्रमंडलों के द्वारा प्रत्येक योजनाओं के लिए पृथक् रूप से लेखा संधारित किया जाएगा।
- 15.2 कार्यपालक अभियंता समस्त आय एवं व्यय का वार्षिक लेखा तुलन पत्र के साथ मुख्यालय को ससमय उपलब्ध करायेंगे ताकि मुख्यालय द्वारा ससमय समेकित लेखा तैयार कराया जा सके एवं अंकेक्षण के पश्चात् वार्षिक आमसभा में सदस्यों के अनुमोदनार्थ इसे उपस्थापित किया जा सके।
- 15.3 कार्य प्रमंडलों के द्वारा वार्षिक खाता का संधारण दोहरी प्रविष्टि पद्धति (Double Entry System) के माध्यम से योजनावार पृथक् रूप से किया जाएगा।
- 15.4 प्रत्येक योजनाओं के लिए पृथक् रूप से बैंक समाधान विवरण तैयार किया जाएगा।
- 15.5 स्रोत पर कर की कटौती आदि अगले माह के 15 तारीख तक सरकार के राजस्व खाते में एवं आयकर Vat आदि के लिए कटौती की राशि को अगले माह के 7 तारीख तक केन्द्र सरकार

के राजस्व खाते में हस्तांतरित करा दिया जाएगा।

- 15.6 बैंक गारंटी के संबंध में कार्य प्रमंडलों को अत्यंत सतर्क रहने की आवश्यकता है। इस संबंध में उचित आंतरिक नियंत्रण PIU द्वारा रखा जाना आवश्यक है।

## 16. अंकेक्षण

- 16.1 बिहार ग्रामीण पथ विकास अभिकरण, Accounts की लेखा परीक्षा वित्तीय वर्ष बन्द होने के छः माह के भीतर सी०ए०जी० द्वारा अनुमोदित पैनल में से चुने गये किसी चार्टर्ड एकाउन्टेन्ट से कराएगी। इस Accounts के Support में कार्य प्रमंडलों के लेखा के साथ-साथ Reconciliation और इसकी सत्यता के संबंध में चार्टर्ड एकाउन्टेन्ट का प्रमाण-पत्र प्राप्त किया जाएगा।
- 16.2 चार्टर्ड काउन्टेन्ट द्वारा लेखा परीक्षा के अलावा इस कार्यक्रम के अंतर्गत कार्यों की भारत के नियंत्रक एवं महालेखा-परीक्षक के कार्यालय द्वारा भी लेखा परीक्षा की जाएगी। नियंत्रक एवं महालेखा-परीक्षक द्वारा लेखा परीक्षा कार्य में वित्तीय लेखा परीक्षा के अतिरिक्त गुणवत्ता पहलुओं को भी लिया जा सकता है।

## 17. विविध

- 17.1 योजना के क्रियान्वयन में अभियंताओं के साथ-साथ संवेदकों का भी विशेष योगदान होता है। अतः योजना में कार्यान्वयन एजेंसी के अभियंताओं एवं संवेदक/संवेदक के अभियंताओं के प्रबंधन एवं तकनीकी उन्नयन के लिए समय-समय पर आवश्यक प्रशिक्षण का प्रावधान भी किया जाएगा। इसमें प्रशिक्षण, सेमिनार, कार्यशाला आदि शामिल होंगे।
- 17.2 ग्रामीण कार्य विभाग समय-समय पर ऐसे निदेश जारी करेगा जो कार्यक्रम के निर्वाह क्रियान्वयन के लिए आवश्यक हो।
- 17.3 इस योजना की प्रभावी अनुश्रवण हेतु विभाग के द्वारा Management Information System (MIS) विकसित किया जाएगा, जिसमें लैप टॉप, कम्प्यूटर एवं Tablet PC, CUG आदि का उपयोग होगा।

# खण्ड—IV

पंचवर्षीय सड़क अनुरक्षण



## पंचवर्षीय सड़क अनुरक्षण

### 1. प्रस्तावना

पथ का निर्माण कार्य पूर्ण होने के पश्चात 5 वर्षों तक सड़क का रूटीन अनुरक्षण कार्य संवेदक द्वारा किया जाना एकरारनामा के तहत अनिवार्य (Mandatory) शर्त है। भू-भाग, मिट्टी, जलवायु, पथ में होने वाले सामान्य Wear & Tear आदि के कारणों से पथ का निर्माण गुणवत्ता पूर्ण होने पर भी रूटीन अनुरक्षण की आवश्यकता पड़ती है। पथ निर्माण कार्य पूर्ण किये जाने की अगली तिथि से अगले पाँच वर्षों तक अनुरक्षण कार्य किया जाता है।

#### 1.1 अनुरक्षण के प्रकार

अनुरक्षण दो प्रकार के होते हैं :-

(क) **सुधारात्मक अनुरक्षण (Corrective Maintenance) :** Construction defects यथा पथ में Proper compaction में कमी के कारण पथ का Pavement धंस जाय तो इसे सुधारात्मक अनुरक्षण के अंतर्गत माना जाएगा। संवेदक द्वारा defects का आवश्यक सुधार कार्य किया जाना अनिवार्य होगा। लेकिन इसके लिए उन्हें राशि का भुगतान देय नहीं होगा। इसकी समयावधि भी पाँच वर्षों की होगी।

(ख) **निवारात्मक अनुरक्षण (Preventive Maintenance)** के अंतर्गत Routine Maintenance कार्य निम्नवत् होगा :-

- (i) क्षतिग्रस्त भाग की मरम्मत।
- (ii) Raincuts एवं Shoulders की मरम्मत।
- (iii) गाँव का नाम, गति सीमा, Caution board आदि का Repainting।
- (iv) पुल/पुलियों के नीचे जमे गाद की सफाई।
- (v) Road Furnitures लोगो, सूचना पट्ट आदि का Repainting।
- (vi) पथ पर अवस्थित पेड़ों की टहनियों की छटाई एवं जंगली घास फूस

#### 1.2 Raincuts :

मिट्टी की गणना औसतन 30 से०मी० Depth मानकर की जाएगी। पाँच वर्षों के लिए औसतन मध्यम श्रेणी की बारिस के आधार पर Quantity की गणना की जाएगी जबकि तृतीय, चतुर्थ एवं पंचम वर्ष के लिए Rain Cuts की मात्रा को Multiplying Factor से गुणा किया जाएगा।

Rainfall			
Year	High	Medium	Low
I Year	7.5%	6.0%	5.0%
II Year	9.0%	7.2%	6.0%
III Year	10.5%	8.4%	7.0%
IV Year	12.0%	9.6%	8.0%
V Year	13.5%	10.8%	9.0%

CD works का Desilting कार्य, Road Furniture Items का Repainting, निर्माण कार्य हेतु स्वीकृत प्राक्कलन की संख्या के अनुसार एवं रोड के किनारे अवस्थित पेड़ों की टहनियों की छटाई एवं जंगली घासों की कटाई आदि प्रावधान आवश्यकतानुसार किया जाएगा।

निर्माण कार्य हेतु स्वीकृत प्राक्कलन की संख्या के अनुसार एवं रोड के किनारे अवस्थित पेड़ों की टहनियों की छटाई एवं जंगली घासों की कटाई आदि प्रावधान आवश्यकतानुसार किया जाएगा।

सड़क अनुरक्षण हेतु The Specifications of Items of routine Maintenance एवं दर की गणना के लिए Standard Data book of Rate Analysis for Rural Roads से की जाएगी तथा प्राक्कलन पर तकनीकी स्वीकृति संबंधित कार्यपालक अभियंता के द्वारा प्रदान की जाएगी।

### 1.3 पर्यवेक्षण एवं क्रियान्वयन

- (i) कनीय अभियंता — प्रत्येक माह
- (ii) सहायक अभियंता — माह जनवरी, मार्च, मई, जुलाई, सितम्बर एवं नवम्बर
- (iii) कार्यपालक अभियंता — माह अप्रैल एवं अक्टूबर

विशेष परिस्थिति में आवश्यकतानुसार कम अंतराल पर भी पर्यवेक्षण का कार्य एवं संवेदक को आवश्यक निदेश निर्गत किया जाएगा।

संवेदक प्राप्त निदेश के आलोक में अनुरक्षण कार्य कर अनुपालन प्रतिवेदन एवं कराये गये कार्य का विपत्र कार्यपालक अभियंता को उपलब्ध कराएगे। कनीय अभियंता द्वारा कराये गये कार्य की मापी लेकर विपत्र तैयार किया जाएगा तथा इसकी जाँच सहायक अभियंता/कार्यपालक अभियंता द्वारा किया जाएगा। कार्यपालक अभियंता द्वारा नियमानुसार विपत्र का भुगतान संवेदक को किया जाएगा।



#### 1.4 व्यय प्रक्रिया –

सड़क अनुरक्षण कार्य हेतु राज्य स्तर पर अलग बैंक खाता खोला जाएगा। सचिव, बिहार ग्रामीण पथ विकास अभिकरण की अनुशंसा पर सभी संबंधित कार्यपालक अभियंता का खाता राज्यस्तरीय बैंक में खोला जाएगा। कार्यपालक अभियंता किये गये कार्य के मापी एवं **Bill** के आधार पर अनुमान्य वर्ष के लिए राशि की अधियाचना विहित प्रपत्र में मुख्यालय से करेंगे। बिहार ग्रामीण पथ विकास अभिकरण द्वारा अनुमान्य वर्ष के लिए अधियाचित राशि का भुगतान प्राधिकार निर्गत किया जाएगा। कार्यपालक अभियंता छमाही अन्तराल पर नियमानुसार विपत्र का भुगतान करेंगे।



# खण्ड—V

गुणवत्ता नियंत्रण एवं  
पर्यवेक्षण



## 1. Introduction

Quality and Supervision of works being undertaken under GTSNY scheme shall be carried out under the ambit of Quality Monitoring cell set up by the department to bring about innovative reforms and the best practices in enhancing the efficiency of the department.

Quality Monitoring Cell shall work on a three-tier quality management mechanism which is proposed to be operationalized with web based online system with centralised database for ensuring that the quality of assets created conform to the prescribed standards.

The Quality Monitoring Cell envisages a three-tier Quality Monitoring mechanism:

### 1.1 First Tier

The first tier shall be managed by PIU. The stipulated tests as per the contract will be conducted in Quality Control laboratories established in field. The test results shall be recorded in the prescribed Quality Control Registers. If the Contractor is responsible for infrastructural arrangements for Quality Control Tests, then the following check mechanism are prescribed.

- 1) All the tests should be conducted by the designated qualified staff of the Contractor and the Quality Control Register Part-I is to be maintained by him.
- 2) For effective Quality Control, the following percentages of various categories of tests will be done by the designated staff of Contractor in the presence of the JE/AE/EE:
  - a) 50 percent of the tests are conducted in the presence of the JE.
  - b) 20 percent of the tests are conducted in the presence of the AE
  - c) 5 per cent of the tests shall be conducted in the presence of the EE.

All the test results will be recorded in Quality Control Register-I.

The monthly return of the tests will be submitted in the prescribed Performa by the Junior Engineer & Assistant Engineer to the Executive Engineer in the first week of every month. The Executive Engineer will review this return regularly to see that the Quality Control tests are being performed at the desired frequency and with required accuracy. The EE will also see that the Non-Conformance reports are issued by the AE whenever Non - Conformance occurs and the Contractor promptly takes actions on Non - Conformance reports. The reporting as enumerated above shall also be carried out on online mode on the State Quality Monitoring Portal. Restricted access to the contractors to the online

monitoring tool shall be also be provided for viewing and compliance thereof in case of Non-Conformance.

## **1.2 Second Tier**

As the second tier of Quality Control structure, periodic inspections of works will be carried out by the Independent Engineers to be engaged by the Department on Outsourcing basis/Long term contract basis/Empanelment and they will be independent of the Executive Engineer/PIUs. This tier of Quality monitoring is very important and has been designed to see that the Executing agency is carrying out the Quality Controls per specifications. The following process is to be adopted for 2<sup>nd</sup> Tier Quality Monitoring.

- 1) The programme IE shall be drawn up through systematic sampling in online mode in such a way that every work is inspected at-least two times. The first inspection of every work shall be carried out during the execution of work and the last inspection shall be carried out on the completion of every work, within one month of its completion.
- 2) The Quality Monitoring Cell will draw up a monthly Schedule for IE (Block/District wise) so as to ensure systematic coverage.
- 3) The Quality Monitoring Cell will send the IE's reports to the Project Implementing Unit with a copy to the concerned SE/CE.
- 4) The IE will hold Meetings with PIUs and the Contractors and inspect Field/District Laboratories to ensure smooth functioning of the Quality Control Mechanism.
- 5) The IE will have to interact with the State Technical Agencies in matters relating to the design, testing and execution.
- 6) IE will prepare a monthly report and send to Central Quality Monitoring Cell containing the analysis which would include findings of the PIU reports, IE reports, action taken in individual cases and systemic deficiencies detected and remedied.

All cases of delay in reporting compliance and major cases of deviation from acceptable Quality shall be taken seriously.

It is to be noted that all the reports shall be in hard form and simultaneously shall be submitted online into the web portal.

The IE would be given a detailed format in online mode for the inspection report that should cover the following aspects.

- a) Design of pavement and CD works & HL Bridges
- b) Provisions made in estimates with regard to site requirements.
- c) Management of the contract, deployment of qualified staff by the Contractor and establishment of a functional Quality Control Laboratory by the Contractor.
- d) Construction Programme and progress of work.
- e) Execution methodology and adherence to specifications.
- f) Arrangement at Quality Testing Laboratories.
- g) Record of Tests- Quality Control Registers and their upto date maintenance.
- h) Accuracy of Quality Control Tests, issuance of Non Conformance Reports (NCR) and action of Contractor on NCRs.
- i) Inspection of departmental officer and compliance of their instructions.
- j) Provision and execution of CD works and side drains & H L Bridges.
- k) Road furniture, Logo, Signboards and caution boards
- l) Other issues including the technical knowledge of the staff of the executing agency and the Contractor.

### **1.3 Third Tier**

The third tier shall comprise Principal Quality Monitors (PQM's) appointed by the Department for the purpose, who shall generally be retired Senior Engineers from State/Central organizations.

The third tier of Quality Monitoring is oriented more towards verification and review of systems and procedures being adopted at 1st and 2nd tier of Quality Monitoring, so that it can be ensured that specified requirements for Quality Management are being met.

The Principal Quality Monitors are required to visit the work in accordance with the priority indicated in the guidelines issued to them at under section "Prioritization of Works for Inspection".

## **2. Roles and Responsibilities**

- a) PQM's will carry out Quality testing of works on random sampling basis from the priority list, mainly in order to confirm that the programme implementation and

Quality Control System is working satisfactorily.

- b) PQMs are expected to make constructive suggestions relating to procedural aspects in addition to locating problems at individual work level.
- c) To bring out systemic deficiencies/ shortcomings and suggestions for improvement in
  - Design and Estimation
  - Execution and Supervision
  - Quality Control
  - Contracting etc.
- d) PQM's will submit all individual work wise Inspection Reports along with a general analysis based on the works inspected by him as well as other inspection reports accessed by him.

Since the role of the PQM's is guidance and improvement rather than mere 'fault finding', the analysis is an extremely important aspect and must be prepared with care. The SE operating from Quality Monitoring Cell will be responsible for reporting compliance on the issues raised by PQMs and observations in this regard.

The analysis of the Reports of the PQMs will be done at Quality Monitoring Cell and necessary directions shall be issued for necessary compliance as quickly as possible. The Principal Quality Monitors, who are the third tier in Quality Control, play a vital role in overseeing the Quality of the road and bridge works. With their long experience and expertise, the PQMs will provide valuable insight into the programme and guidance to the executing agencies.

### **3. Inspection by PQM's**

The PQMs shall be given the programme in advance to inspect the works in designated districts of the state in a particular month. The process to be followed is as follows:

- The PQthe next month.

It will be the responsibility of the QMC to ensure adequate arrangements for inspection by the PQM, including ensuring the supply of desired information to PQM by PIUs.

The selection of road to be visited by PQM's in a particular district shall be provided by Quality Management Cell through computerised random sampling basis. Once the road is selected, the PIU shall provide the necessary works information in respect of the road and



also have to ensure that all the information in regards to the selected road is updated in online monitoring portal.

### **3.1 Documents to be provided to PQM's by PIU**

- Copy of Estimate along with drawings of the work proposed to be inspected.
- Quality Control Registers to enable PQM to understand the details of tests conducted.
- Essential equipments and manpower to be provided to PQM to conduct some hand feel tests and field test under this personal supervision.
- With a view to achieve uniformity, objectivity in observations and evaluation, the method of observations and evaluation has been standardised for all the tiers of Quality Management.

**3.2** The PQM has to traverse the entire road up to the end habitation. While making observations, the PQM must keep in mind that the intention is to improve and strengthen the system to achieve overall project quality. As such, the PQM would also focus on project management by the PIU and make his observations on:

- **Contract Management:**  
Observations regarding contractual provisions of identifying defects, communication to the Contractor and rectification thereof shall be recorded by the PQM. In addition, observations on issues of Time Control mechanism as adopted by the PIU shall be recorded. The observations regarding delays and work programme should also be made.
- **Designing and Estimation:**  
The observations would be made based on the scrutiny of the Detailed Project Report. The observations regarding traffic, CBR and appropriateness of design of CDs would be made based on the inspection of site. It may not be always necessary to conduct detailed tests or surveys for general assessment of adequacy.
- **Geometrics:**  
The observations would be based on inspection of the entire road length and provisions made in the DPR.

- **Quality Control Arrangements:**  
The observations should be based on visit to field laboratory, the test facilities available, adequacy of manpower for carrying out the tests, system of bringing samples to the testing lab as well as system of recording of results and examination of Quality Control
- **Attention to Quality:**  
The observations on number of tests conducted should be based on examination of Quality Control Register Part I. The system of identifying failed tests and action taken by PIU/ IE would be examined and commented upon by the PQM.
- **Inspections:**  
Observations regarding inspections and compliance of PQM/ IE visit would be based on the information submitted by PIU.
- **Observations on Quality of Items of Work:**  
The PQM is expected to give the observations in respect of the items, which can be easily inspected or are under construction. It may not always be necessary to conduct detailed tests to support every observation. The PQM with his experience is expected to be able to make observations based on hand feel tests or by visual inspection and make a mention accordingly.
- **Other Observations:**  
The PQM may like to give some guidance or may like to make observations on the certain items, is free to do so for better interest of the project.

#### **4. Post Inspection Discussion**

During inspecting the roads, the PQM should

- Hold an informal meeting with the PIU officers and Contractors engineers in order to review the findings of the inspection and to suggest improvements in execution to obtain better Quality for all other works under the PIU.

#### **5. Submission of Inspection Report by PQM and Action by PIU**

- a. After the inspections in the District are over and copy of reporting format in hard form will be handed over by the PQM to the PIU and also enter the same in online mode in the monitoring portal so that they can be accessed by Quality Management Cell.

- b. It is open to the PQM to discuss the specific issues arising from the road inspection with the head of the PIU. Unless the PIU disagrees with the conclusion/ recommendations, rectification work should be ordered immediately by the PIU. In case the head of the PIU feels that any portion of the Inspection Report or the suggested rectification is not appropriate he shall make a full report to the Quality Management Cell.

## **6. Web Based Online Monitoring System**

Computerisation of data has the advantage of reliable storage, easy retrieval, immediate processing and complicated calculation ability useful in generating high level abstracted information for use in management. The advantage of a Centralised database is that the range of comparison is not only vertical in terms of the time period but also horizontal in terms of geographic spread across Districts and States. If to this is added the facility of being able to access the data anywhere/anytime through a web-based system, the utility and transparency is multiplied manifold, enabling an extremely high level of project management and monitoring.

The SQMS (State Quality Management System) software shall be designed especially for all the road and bridge works being executed by the department as an online web-based system with centralised database and the principles underlying the operational management of the software shall be as follows:

- Data entry will be done at the point where data will be generated i.e. at the PIU level for project data and at the IE , PQM and QMC level where their intervention contributes value addition to the data.
- The data entry shall be near real-time to enable outputs to be useful for management as well as monitoring. This implies that the data entry shall be closely parallel the actual work process and to ensure this, system checks will be in place to ensure that the data precedent is on-line before processing for the next step is done.
- Since data entry may involve some extra effort, it must be seen to be sufficiently advantageous. This involves building in the ability to generate MIS outputs closely resembling or better than existing manually generated outputs and dispensing with manually generated outputs and attendant labour.

- The full power of the software is to be brought to bear to generate outputs useful at all levels – monitoring and management output at PIU levels, progress management and management-by-exception outputs at IE/PQM level and abstracted and analysed information policy and overall management information for use in QMC.
- Transparency will be inbuilt in the system enabling abstracted data to be drilled down to the basic data, generally 'road' or 'Habitation'.

### **6.1 Online Monitoring Responsibilities**

Effective monitoring of the Programme being critical, the QMC must ensure that all aspects of the rural road programme in the State are systematically monitored and feedback used for correcting deficiencies. The Online Management & Monitoring System to be developed shall be the chief mechanism for monitoring the Programme. Officials managing the various aspects of the programme are required to furnish online all the data in respect of road details and transactions carried out by them in the relevant module of the Online Monitoring System.

The SQMS shall consist of the following main modules:

- Master data Module: - Master data includes the following
  - Area master which contains data regarding the villages/Habitations and details of facilities available at habitation level (To be entered at PIU level).
  - Roads master which includes details regarding the name of the road, surface type etc. (To be entered at PIU level).
  - Contractor master (To be entered at PIU level).
  - MP/MLA Constituency (To be entered at PIU level).
  - Contractor details (To be entered at PIU level).
- Execution & Monitoring Module
  - Entry of progress against each work in physical and financial terms (to be entered at PIU level).
  - Completion of road works (to be entered at PIU level).
- Maintenance Module: -Physical and financial data regarding 5 years contract-based maintenance (to be entered by PIU level).

- Quality Monitoring –Data Regarding QC inspection carried out by IE's & PQM's is to be entered. The monthly schedule of inspection of IE and PQM shall also entered on website.

## **6.2 Operating the State Quality Management System**

The QMC shall appoint one officer of sufficient seniority and having adequate knowledge of Information Technology to function as the Nodal Officer for managing the system. His function will be to oversee the regularity and accuracy of the data being furnished by the District PIUs. The Nodal Officer shall also be responsible to oversee the upkeep of the Hardware and Software as well as the training requirements of the personnel dealing with the program. He shall maintain close liaison with the software developers and related parties for ensuring hassle free running of the management system.

The QMC will ensure provision of necessary manpower, space and facilities to set up the Computer Hardware at the District and Head Quarter (HQ) Level apart from ensuring regular and timely feeding of data. Since most of the data would reside on the central server located at HQ, so the Nodal Officer will ensure that the central server is functional all 24 hours of the day.

The main function of the Nodal officers will accordingly include the following:

- Ensuring proper management of the central server, including its functioning, maintenance, data backup, and connectivity.
- Overseeing the proper management of the computer system at PIU level, including their functioning, maintenance, connectivity etc.
- Monitoring the progress of data entry at PIU level and apprising the superior authorities of the QMC of persistent delays/failure to update data.
- Supervising bulk data entry, management of data entry operator deployment etc.
- Monitoring effectiveness of online connectivity status of PIU computers, devising and implementing solutions for better and more secure connectivity.
- Coordination with the QMC for ensuring updating of inspection data on the SQMS.

- Ensuring integration of data and applications with similar or complementary applications.
- Printing out monthly/quarterly MIS outputs and submitting them to the Secretary, RWD along with his comments.
- Training needs assessment.

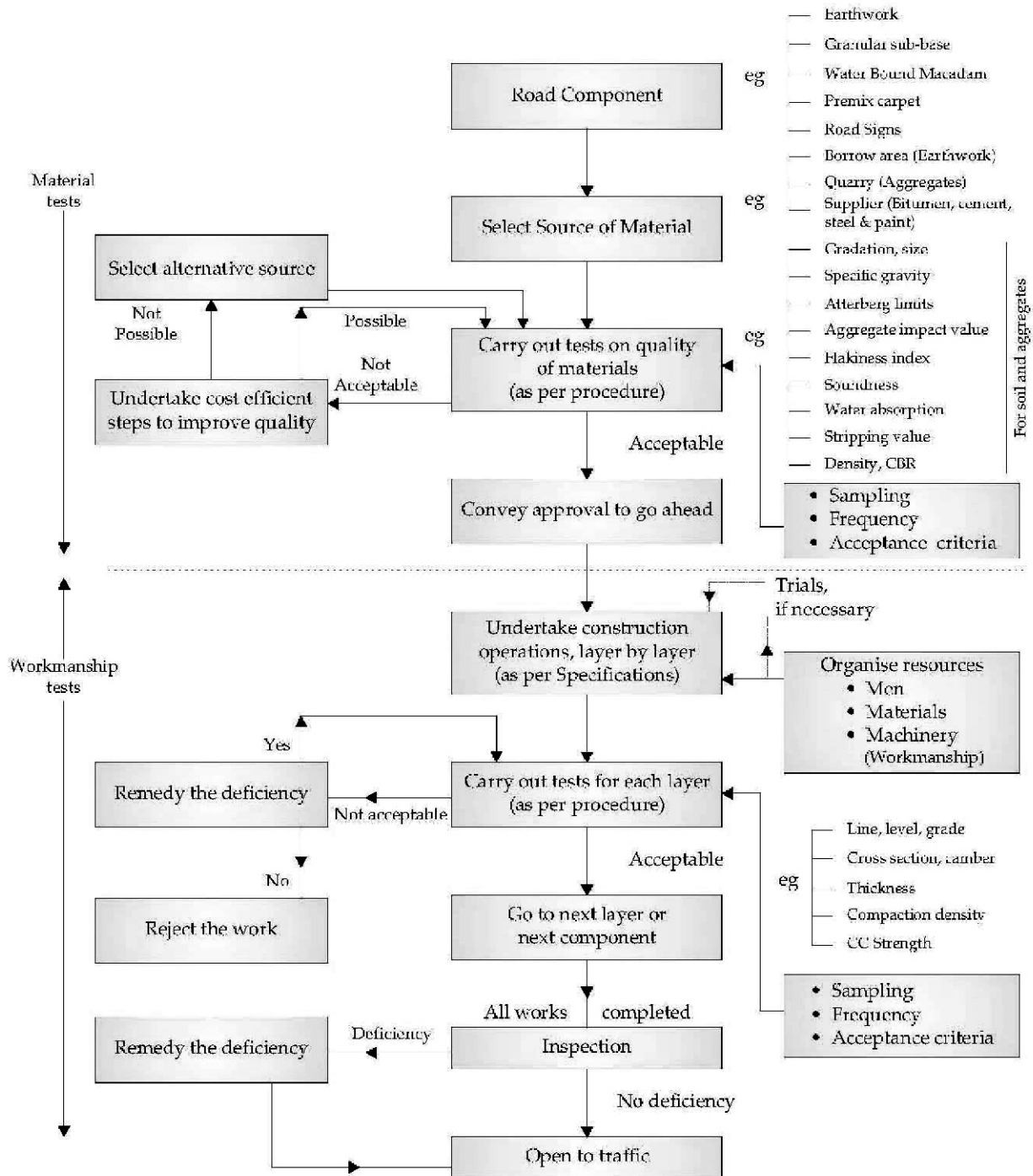
The Executive Engineer/Head of PIU is pivotal to the successful operation of the SQMS and the QMC shall hold him personally responsible in case of persistent failure to keep the data updated. The Executive Engineer/Head of PIU shall be responsible for:

- Ensuring proper management of the DPIU computers and peripherals including the software, data backup etc.
- Enforcing an Annual Maintenance Contract (AMC) for the computer system.
- Ensuring internet connectivity.
- Managing the offline software and uploading of data in case of poor internet connectivity.
- Printing monthly quarterly MIS outputs and forwarding them to the Nodal officer along with his comments on the reliability of the data.

### **6.3 System Checks under SQMS**

In order to ensure accuracy of information at all times, system checks will be placed in the software and it is necessary therefore that data entry is accurately, systematically and regularly done into the system.

A typical flow chart for quality assurance checks during the construction of rural roads is as given below:



## 7. Operational System of Quality Monitoring Cell

### 7.1 Inspection Programme

Inspection programme of the Cell shall be drawn up through systematic sampling in online mode for inspecting the works under following conditions:

- Systematic inspection of all sites to check quality of work and to check whether the execution of work is being carried out as per the agreement.

- b) On directions of the Principal Secretary / Secretary, RWD directs to inspect any particular road
- c) Any grievances/ complaint registered against the quality of any particular road
- d) On request by vigilance cell

Inspection cell shall submit observations on the basis of quality control tests/hand-feel tests/measurements performed under the officer's personal supervision who is duly equipped with necessary equipments to successfully accomplish the checkings.

## **7.2 Prioritization of works for Systematic Inspection**

All roads and bridges shall be inspected by Quality Monitoring Cell in systematic manner with following priorities:

### **1. Priority 1:**

Shall be to inspect works which are at earthwork stage. This is with a view to examine the system and procedures which is being followed by the PIU and the Contractor. Intervention at this stage would help in ensuring that subsequent stages of the work are carried out after system deficiencies are removed.

### **2. Priority 2**

Ongoing works

### **3. Priority 3**

Shall be ongoing works that have not been inspected in the last 3 months.

### **4. Priority 4**

Shall be inspection of completed works.

### **5. Priority 5**

Complaint cases and ATR cases on case to case basis.

## **7.3 Inspection, Observation and Grading of Work**

The role of the officers in Quality Monitoring Cell is to critically examine the all roads and CD work and give feedback about quality of road works and quality related shortcomings for systemic improvements.

### **7.3.1 How to make observations**

There could be many methods of inspecting, making observations and evaluating various items and sub-items involved in construction of a rural road. With a view to



achieve uniformity, objectivity in observations and evaluation, NRRDA guidelines prescribed for National Quality Monitors (NQM) is being followed.

Item-wise observations, their methods, frequency and awardable quality grading have been listed in **Annexure 1**.

Each of the sub-items shown in the Annexure shall be examined as per the method of observation mentioned in column – 4 and as per the frequency mentioned in column – 5. The quality of the sub-item/item would be quantified in one of the 2/3 grades prescribed in column – 6. The observations shall be based on the method of field tests, hand feel tests, measurements and visual observations as specified in column – 4 of the **Annexure 1** only and in no other way.

Observations of ongoing and completed work will be record at the space provided in **Annexure-2**.

Observations on inspection of Manitenance aspect of completed work will be record at the space provided in **Annexure-3**.

Observation shall be recorded on following items:

<b>For Road and CD Sections</b>
<ul style="list-style-type: none"><li>• Quality Control Arrangements</li><li>• Attention to Quality</li><li>• Geometrics</li><li>• Earthwork and Sub-grade in Embankment/Cutting</li><li>• Granular sub-base</li><li>• Shoulders</li><li>• CC/Semi-Rigid Pavement</li><li>• CD Works</li><li>• Road Furniture and Markings</li></ul>

### **7. 3.2 How to organize inspection**

It is expected to traverse through the entire road length to ascertain the quantum of work such as length of road, number of CDs, rigid pavement and other aspects of the work. After the traverse, the locations for detailed observations shall be decided.

In case of on-going work/item of work it is easier to take samples of material. However, in case of completed work/item it may be difficult to take samples.

The observations can be made on the spot by digging a pit either on pavement or at half pavement and half shoulder, as decided.

### 3.3 Sub-item/Item wise Grading and Overall Grading of Work:

Sl. No.	Road Items	Available Grade
1	Quality Control Arrangements	
2	Attention to Quality	
3	Geometrics	
4	Earthwork and Sub-grade in Embankment/Cutting	
5	Granular sub-base	
6	CC/Semi-Rigid Pavement	
7	Shoulders	
8	CD Works	
9	Road Furniture and Markings	
	<b>Overall Grading</b>	

The sub-item wise grading of every item of work would be entered. The overall Item Grading would be entered and shall be calculated in the following manner:

Grading shall be of 3 types vis-a-vis:

1. Unsatisfactory. (U):  
If, any of the items in item no. 3, 4, 5 and 6 are graded as 'U', overall grading of the work shall be **'U' i.e. 'Unsatisfactory'**.
2. Satisfactory but requires Improvement. (S-RI)  
If, all the items given in above four items are 'S' but grading in any of other items is 'U' or 'RI', the overall grading of work shall be **'S-RI' i.e. Satisfactory but Requiring Improvement.**
3. Satisfactory. (S)  
If grading of all items is 'S', the overall grading of work shall be **'S' i.e. 'Satisfactory'**.

#### 7.4 Reporting and Submission of Inspection Report

All the observation compiled in desired format will be submitted on line for further action.

## **7.5 Action Taken Report**

Action Taken report shall be prepared and submit online, if grading shall be 'U' or 'SRI' (**Annexure-4**).

### **7.5.1 Guidelines on Action Taken Report**

At PIU level the following action shall be taken

- 1) After the inspections in the district are over and copy of Annexure-2 of reporting format will be handed over by the PQM to the PIU, copies will be sent to the Quality Monitoring Cell within 10 days after completing inspection. Unless the PIU disagrees with the conclusion/recommendation, rectification work should be ordered immediately by the PIU. In case the head of PIU feels that any portion of the inspection report or the suggested rectification is not appropriate, he shall make a full report to the Quality Monitoring Cell.
- 2) The Action Taken Report will be prepared by Executive Engineer/Head of Project Implementing Unit in the prescribed Format and will be sent to the Quality Monitoring Cell.
- 3) The Action taken report submitted should be comprehensive, i.e. merely writing letter to the Quality Monitoring Cell or to the subordinate doesn't constitute action taken and should not be treated as ATR.

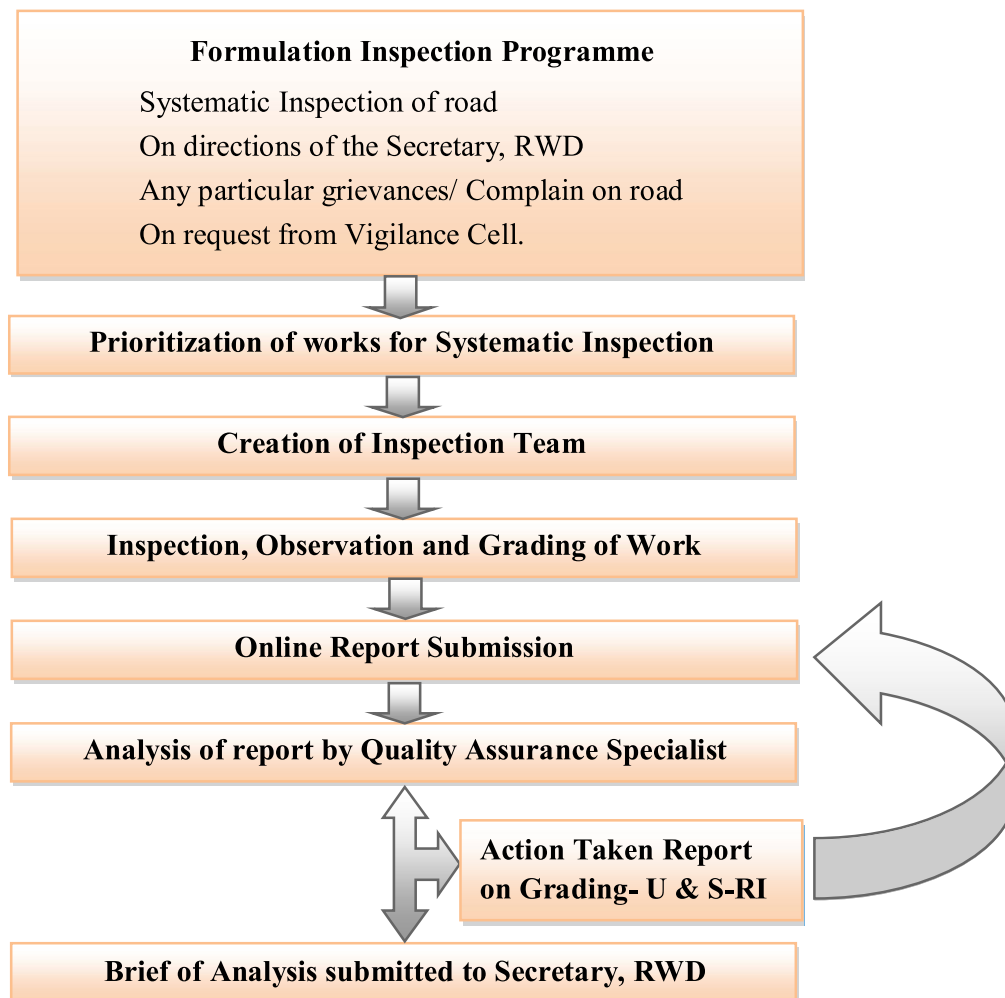
At Quality Monitoring Cell level, the following actions shall be taken:

- 1) On receipt of the report of the PQM the Quality Monitoring Cell (QMC) will immediately remind the Project Implementing Unit/Executive Engineer for taking action and reporting on every paragraph of the report. He will also initiate action on the general issues brought out by the PQM in his report for remedial action by all concerned.
- 2) In case there is disagreement with the finding/recommendation in a PQM Report, this should be communicated as part of the Action taken Report duly supported by test results/findings of QMC and sent by the DPIU.
- 3) The QMC will generally compare findings of the PQM and QMC to find if the two are in conformity.
- 4) The Quality Monitoring Cell (QMC) shall prepare and send a Report to Principal Secretary/Secretary, RWD. The report shall contain analysed performance of the PQM, general deficiencies observed/highlighted through

PQM reports and action taken/required to be taken to remedy systematic deficiencies at organisational level in order to improve the Quality of roads and programme performance

- 5) The QMC will after, scrutiny of PQM reports, grade the works as 'satisfactory' or 'unsatisfactory' .All cases where work appears unsatisfactory and all other cases where action is required will be for taking action and Submitting Action Taken Report.
- 6) The QMC will analyse ATRs for their compliance and further follow up if required.
- 7) QMC at periodic intervals shall get the PQM reports as well as the Annual Quality Report analysed through STA or PTA, who shall make recommendations on systematic action to be taken at organizational level to improve Quality of roads and programme performance in the state.

**Flow Diagram: Operational System of Quality Monitoring Cell**



**Annexure-1**

**Statement showing item-wise observations, their methods, frequency and awardable quality grading**

#	Sub Item for observation	In case of work	Method of Observation	Frequency	Grades
1	2	3	4	5	6
	Quality Arrangements	On-going	Verification of field laboratory and availability of equipments	General observation	S/RI/U
<b>Item Grade</b>					S/RI/U
<b>Item 2 – Attention to Quality</b>					
a	Maintenance of QC Register	On-going	Verification of QC Register I and II	General observation	S/RI/U
b	Verification of test results	On-going/ Complete	Verification of test result on the basis of field tests	Not Specified	S/U
<b>Item Grade</b>					S/RI/U
<b>Item 3 - Geometrics</b>					
a	Road way width	Ongoing or complete	Actual Measurements	2 per Km	S/U
b	Carriageway width		Actual Measurements	2 per Km	S/U
c	Camber		Measurements	2 per Km	S/U
d	Superelevation & Extra Widening at Curves		Measurements	2 per Km	S/U
e	Longitudinal Gradient in case of road in hilly/ rolling terrain	Ongoing/ complete	Visual Observation/ Measurements	2 critical stretches in a Km	S/U
<b>Item Grade</b>					S/U
<b>Item 4 - Earth Work and Sub-grade in Embankment/ Cutting</b>					
a	Quality of Material for Embankment/ Sub-grade	Ongoing or complete	Visual Classification of Soils	1 per Km	S/U
b	Compaction		Field Density Test by sand replacement/core-cutter method.	1 per Km	S/U
c	Side Slopes and Profile	Complete	Measurement	4 Observations per Km	S/U
d	Stability and Workmanship of Cut Slopes (in case of hilly/ rolling terrain)	Ongoing or complete	Visual Observation	4 per Km	S/U
e	Adequacy of Slope Protection (in case of high embankments/hilly/ rolling terrain)		Visual Observation	4 per Km	S/U
<b>Item Grade</b>					S/U
<b>Item 5 - Shoulders</b>					
a	Quality of material for shoulders	Complete	Visual classification of soil	1 test per Km	S/RI/U
b	Degree of compaction	Complete	Field Density Test by sand replacement/core-cutter method.	1 test per Km	S/RI/U
c	Camber.	Complete	Measurements	1 test per Km	S/RI/U
<b>Item Grade</b>					S/U

<b>Item 6 - Cross Drainage Works upto 6 m. span.</b>					
a	Quality of Material – Concrete, Stone/ brick masonry, Hume pipes including size etc.	Ongoing or complete	Visual observation ( for CC verify cube test results from records)	General observation	S/RI/U
b	Quality of Workmanship such as positioning of pipes, wing walls, cushion over H Pipes etc.		Visual observation	General observation	S/RI/U
<b>Item Grade</b>					S/RI/U
<b>Item 7 - Side Drain and Catch Water Drain</b>					
	General quality of Side Drains/ Catch Water Drains and their integration with CDs.	Ongoing or complete	Visual observation	General observation	S/RI/U
<b>Item Grade</b>					S/RI/U
<b>Item 8 - Rigid Pavements</b>					
a	Quality of Material – Concrete, Stone/ Concrete Block Pavement etc.	Ongoing or complete	Visual Observation	1 per 100 m. Length of Pavement	S/U
b	Strength of CC in Concrete Pavement/ Concrete Block Pavement		Strength using appropriate rebound hammers/ verification of cube test results from test records.	1 per 100 m. Length of Pavement	S/U
c	Quality of Workmanship – Wearing surface texture, Adequacy of setting of concrete, Joints, Edges etc.		Visual observation	General observation	S/U
d	Thickness of Layer		Measurements	1 per 100 m. Length of Pavement	S/U
<b>Item Grade</b>					S/U
<b>Item 9 - Road Furniture and Markings</b>					
a	Citizen Information Board, Main Informatory Board, Quality and whether fixed during construction.	Ongoing	Visual observation	General observation	S/U
b	Logo boards, 200 m stones and Km stones, quality and whether fixed after completion.	Complete	Visual observation	General observation	S/U
c	Whether the information in boards is given in local language.	Complete/ Ongoing	Visual observation	General observation	S/U
<b>Item Grade</b>					S/U

**Observation for Ongoing and Completed Work: Road**

**1. QUALITY ARRANGEMENTS-OBSERVATIONS (In Case of ongoing works only):**

**Observations:**

#	Whether Field laboratory Established (Y/N)	Whether necessary Equipments available (Y/N)	Whether Equipments have been used (Y/N)

<b>Grading:</b>	<input type="checkbox"/> S	<input type="checkbox"/> RI	<input type="checkbox"/> U	Grade:	If this item is graded RI/U, write clear reasons and suggestions for improvement:

**2. ATTENTION TO QUALITY: (In Case of ongoing works only):**

**Observations – Item 2a: Maintenance of QC Registers:**

#	Based on executed quantities whether all mandatory tests conducted	Whether QC Register Part I maintained as per provisions	Whether QC Register Part II maintained and test results monitored as per provisions.
	<input type="checkbox"/> Yes <input type="checkbox"/> Partly <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Partly <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Partly <input type="checkbox"/> No

**Observations – Item 2b: Verification of Test Results (P – conforms, F – does not conform):**

	Name of Test	Results of the test conducted by PQM at a defined location. (P/F)	Test result as per QC Register at the same location. (Mention the page No. of QC Register also) (P/F)	Whether the test results recorded in QC register found correct? (Y/N)

Grade	S	RI	U	:	If this item is graded RI/U, write clear reasons and suggestions for improvement:

**3. GEOMETRICS:** At-least two measurements in 1 km length and if it is found that the roadway and carriageway is inadequate PQM may take more observations:

**Observation – Item 3 a, b and c: Road way width, Carriage and Camber.**

Reference Road	Roadway Width (m)	Carriageway Width (m)	Reference Road	Roadway Width (m)	Carriageway Width (m)

**Observation – Item 3 d: Super elevation and Extra Widening at curves.**

Reference Road	Super Elevation	Extra Widening provided (Y/N)	Reference Road	Super Elevation	Extra Widening provided (Y/N)

**Observation – Item 3 e: Longitudinal Gradient in case of road in hilly/rolling terrain:**

Ref. Between RD... & RD...	Longitudinal Gradient	S/U	Ref. Between RD...& RD...	Longitudinal Gradient	S/U



Grade  S  U : If this item is graded U, write clear reasons and suggestions for improvement

**OBSERVATIONS REGARDING THE QUALITY OF ITEMS OF WORK:**

**4. Earthwork:**

**Observations – Item 4 a Quality of Material for Embankment/ Sub-grade:**

#	Location (RD)	On Visual Classification identify the Groups Symbol and write	Quality of material is acceptable. (Y/N)

**Grade**  S  U : If this item is graded U, write clear reasons and suggestions for improvement:

**Observation – Item No. 4 b: Workmanship for Embankment and Sub-grade Construction:**

#	Location (RD)	MDD KN/m3 (As per record)	Field Moisture Content	Degree of Compaction		
				Field Density kN/m3	Dry Density kN/m3	Compaction adequate. (Y/N)

Grade 

S	U
---	---

 : If this item is graded U, write clear reasons and suggestions for improvement:

**Observation – Item No. 4 c, Side slopes and profile:**

#	Location (RD)	Whether Side Slopes Satisfactory (Y/N)	Whether profile is Satisfactory (Y/N)

Grade 

S	U
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 : If this item is graded U, write clear reasons and suggestions for improvement:

**5. Sub-Base**

**Observations- Item No. 5 a,b,c and d, Quality of Material and workmanship**

#	Location (RD)	Confirms to Grading. (Y/N)	Suitable from plasticity angle. (Y/N)	Whether compaction is adequate. (Y/N)	Observed Thickness of Layer (in mm)	Prescribed Thickness provided (Y/N)

Grade 

S	U
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 :

If this item is graded U, write clear reasons and suggestions for improvement:

**6. Observations- Item No. 8 a and b, Quality of Shoulders (in case of completed works):**

#	RD of Observation	Whether general quality of the material is acceptable. (Y/N)	Whether general quality of workmanship is acceptable. (Y/N)	Whether Camber in Shoulders is adequate (Y/N)

**7. Cross Drainage Works: Observations Item No. 9 a and b, Quality of CDs:**

#	RD at which CD is located	Type of CD	Whether general quality of the material is acceptable. (Y/N)	Whether general quality of workmanship is acceptable. (Y/N)

**8. Side Drains and Catch water Drains: Observations:**

#	Reference of RDs where side drain constructed.	RD at which observation made.	Whether general quality of the side drains/ catch water drains is acceptable.(Y/N)	Whether side drains are integrated to cross drains. (Y/N)

Grade  S  U : If this item is graded RI/U, write clear reasons and suggestions for improvement

**9. Rigid (SR) Pavements: Item No. 11 a, b, c and d:**

#	Reference of RDs, CC/SR Pavements provided.	RD at which observation made	Thickness		General quality of material acceptable. (Y/N)	General quality of workmanship is acceptable. (Y/N)
			Thickness in mm	Acceptable (Y/N)		

Grade  S  U : If this item is graded U, write clear reasons and suggestions for improvement:

**10. Road Furniture and Markings**

**Observations – Item No. 12 a: Quality Road Furniture and Markings (in case of ongoing/completed works):**

Main Informatory Board Fixed: Yes/No

Citizen Information Board Fixed: Yes/No

Grade	<input type="checkbox"/> S	<input type="checkbox"/> U	:	If this item is graded U, write clear reasons and suggestions for improvement:
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**Observations – Item No. 12 b: Quality Road Furniture and Markings (in case of completed works):**

i. Logo Board Fixed: Yes/No

ii. Mandatory and Cautionary Sign age Yes/No

Grade	<input type="checkbox"/> S	<input type="checkbox"/> U	:	If this item is graded U, write clear reasons and suggestions for improvement:
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**13. General Observations of PQM, (including the observations made during the interaction with PIU staff and Contractor/ Consultant Engineers):**

- a) Observations about deficiency in project preparation (Give detailed observations about deficiencies in general and items which have been left but are required as per site conditions):
- b) Whether the work has been completed/is in progress as per work programme or the delay has occurred. If delay has occurred, whether the liquidated damages have been withhold or recovered:
- c) Whether the work has been completed within the sanctioned cost, if not, what is the action taken by the PIU (in case of complete works)

- d) Observations about the action taken by PIU on the observation of inspecting officers including IEs and PQMs. (Clearly offer comments about the action taken on the observations of Departmental Officers, State Quality Monitors and National Quality Monitors).
- e) Comments about difference in observations made by PQMs/IEs in earlier inspection ( the NQM shall study the earlier inspection reports of NQMs / SQMs, if any and offer his clear comments about the difference in observations, if any).
14. Other observations, if any:
15. Quality Grading of item and sub-items of work: The grading of every sub-item and item of work is given below.

#	Sub item for observation	In case of Work	Awardable Grades	Awarded Grade
1	2	3	4	5
<b>Item 1 – Quality Arrangement</b>				
	Quality Arrangement	On-going	S/RI/U	
	Item Grading		S/RI/U	
<b>Item 2 – Attention to Quality</b>				
a	Maintenance of QC Register	On-going	S/RI/U	
b	Verification of test result	On-going/Complete	S/U	
	Item Grading		S/RI/U	
<b>Item 3 – Geometrics</b>				
a	Road way width	Ongoing or	S/U	
b	Carriageway width	Complete	S/U	
c	Camber		S/U	
d	Super elevation & Extra Widening at Curves		S/U	
e	Longitudinal Gradient in case of road in hilly/ rolling terrain.	Ongoing or Complete	S/U	
	Item Grading		S/U	
<b>Item 4 – Earth Work and Sub -grade in Embankment/ Cutting</b>				
a	Quality of Material for Embankment/ Sub-grade	Ongoing or Complete	S/U	
b	Compaction		S/U	
c	Side Slopes and Profile	Complete	S/U	
d	Stability and Workmanship of Cut Slopes (in case of hilly/ rolling terrain)	Ongoing or Complete	S/U	
e	Adequacy of slope protection ( in case of high embankments/hilly/rolling terrain		S/U	
	Item Grading		S/U	
<b>Item 5 – Sub-Base</b>				
a	Grain Size	Ongoing or	S/U	
b	Plasticity	Complete	S/U	
c	Compaction	Ongoing or Complete	S/U	
d	Total Thickness of Layer	Ongoing or Complete	S/U	
	Item Grading		S/U	

<b>Item 6 – Shoulders</b>				
a	Quality of material for shoulders	Complete	S/SRI/U	
b	Degree of compaction	Complete	S/SRI/U	
c	Camber.	Complete	S/SRI/U	
Item Grading			S/SRI/U	
<b>Item 7 - Cross Drainage Works</b>				
a	Quality of Material – Concrete, Stone/brick masonry, Hume pipe including size etc.	Ongoing or complete	S/SRI/U	
b	Quality of Workmanship such as positioning of pipes, wing walls, cushion over H Pipes etc.		S/SRI/U	
Item Grading			S/SRI/U	
<b>Item 8 - Rigid Pavements</b>				
a	Quality of Material – Concrete, Stone/ Concrete Block Pavement etc.	Ongoing or complete	S/U	
b	Strength of CC in Concrete Pavement/ Concrete Block Pavement		S/U	
c	Quality of Workmanship – Wearing surface texture, Adequacy of setting of concrete, Joints, Edges etc.		S/U	
d	Thickness of Layer		S/U	
Item Grading			S/U	
<b>Item 9 - Road Furniture and Markings</b>				
a	Citizen Information Board, Main Informatory Board, Quality and whether fixed during construction.	Ongoing	S/U	
b	Logo boards, 200 m stones and Km stones, quality and whether fixed after completion.	Ongoing	S/U	
c	Whether the information in boards is given in local language.	Ongoing	S/U	
Item Grading			S/U	

16. **Overall Grading of Work:** The overall grading calculated on the basis of item and sub-item wise grading is given below:

#	Item	Awarded Grade
1	Quality Control Arrangements	
2	Attention to Quality	
3	Geometrics	
4	Earthwork and Sub -grade in Embankment/Cutting	
5	Granular Sub -base	
8	Shoulders	

9	CD Works	
10	Rigid Pavement	
11	Road Furniture and Markings	
	<b>Overall Grading</b>	

**Signature:**

Name:

Date:.....





3	<b>Condition of Pavement.</b>				
a	<b>Observations :</b> What is the condition of Road in respect to this item (Detailed) observations should be made as to whether the pavement has pot holes. Cracking etc which is causing disturbance/ discomfort in driving ? If yes, these defects been remained properly routing maintenance				
b	<b>Observations :</b> What is the pavement condition index (PCI) as per annexure 14.7 Para 14.9 of Operations manual?	5	4	3	<3
c	<b>Grading of the above item</b>	<b>S / U</b>			
4	<b>Name of Item/ Activity :</b> Maintenance of drains as per clause 1907 of the Specification, Maintenance of culverts and cause ways as per clause 1908 and 1909 of the Specifications				
a	<b>Observations:</b> What is the condition of Roads in the respect of this item?				
b	<b>Grading of the above item</b>	<b>S / U</b>			
5	<b>Name of Item/ Activity :</b> Maintenance of Road signs as per clause 1910 of the Specification white washing parapet's of C.D. works				
a	<b>Observation:</b> What is the condition of Roads in the respect of this item.				

b	Grading of the above item	<b>S / U</b>
6	<b>Name of Item/ Activity:</b> Maintenance of guard rails and parapet rails as per clause 1911 of the Specifications.	
a	<b>Observation :</b> What is the condition of Roads in the respect of this item	
b	<b>Grading for the above item</b>	<b>S / U</b>
7	<b>Over all grading</b>	<b>S / SRI / U</b>

Date:

Signature  
INSPECTING OFFICER

**Annexure-4**

Format for Action Taken Reports

Action Taken Statement of the Pending Report of PQM of the District:-

Name of the P.Q.M.:-

Date of Inspection:-

Sl. No.	Name of Block	Name of Road/ Package No.	Paragraph of Report on Which Action required		Para wise Action taken	Whether Action is Complete	If "NO" in col.6 Specify the data when the action will be completed	Remarks/Verification of QMC
			S.No. of	Action Required				

All the Defects Observed by P.Q.M have been Rectified by the contractor and checked by me

Observation of P.Q.M.....Complied with PIU's & Verified by me on dated.....

Name and signature with Stamp of PIU with date

Name and Signature of verify officer (SQM) With designation and Date.

Remarks:

Quality Monitoring Coordinator  
Rural Works Department Bihar,  
Patna

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ATR should be substantiated with photographs and test Result

# खण्ड—VI

## Programme Technical Guidelines



## **1.1 Background**

The economic status of any region can be revolutionalised by ensuring all-weather rural connectivity by linking villages with appropriately designed roads. Rural Road Connectivity is a key component of Rural Development for promoting access to economic and social services and thereby generating increased agricultural incomes and productive employment opportunities across the region. It is also, as a result, a key strategy in ensuring sustainable poverty reduction. Notwithstanding the efforts made, over the years, at the State and Central levels through different programmes, many habitations in the state of Bihar will still not be connected by all-weather roads, as these habitations have been left out in the exercise of preparing central and state 'core networks' for conceptual reasons.

## **1.2 Project Objective**

In view of the 7 Resolves as announced by the state Government of Bihar, Rural Works Department have identified such habitations as are neither part of Central Core Network nor State Core Network but nevertheless have the minimum qualifying populations.

At a time when the Government of Bihar has the ambitious target of connecting 48000 identified habitations as per the central and state Core Networks, it has come to the notice of the State Government that a very large number of peripheral tolas and hamlets, themselves eligible as habitations, were not mapped under the Central and State Core Networks as they were 'deemed' connected by means of the connectivity to the main habitation in the vicinity. Most of these tolas are the dwelling places of economically and socially vulnerable sections of the society, namely the scheduled castes, economically backward caste and the scheduled tribes in some areas. It was realised that it would be socially unfair, legally unjust and economically retrograde not to connect these tolas and hamlets of the most deserving categories of the population.

With this aim in mind, the Government embarked upon an unprecedented exercise of identifying all such tolas in the state with the aid of latest technology. CARTOSAT images provided by Indian Space Research Organisation (ISRO) and Google Earth images were scanned and investigated intensively and all such tolas with suspect connectivity status were identified. Afterwards relevant data, especially with regard to connectivity status, required road length, land availability and population were collected by the actual visit to the tolas and by uploading time stamped and geo-tagged data and pics by means of a specially developed android application. This exercise has led to an identification of about

21000 unconnected tolas, including about 13000 tolas with populations 100 and more. Providing connectivity to such tolas, with special road construction specifications will require construction of about 12000 km of roads above and over the targets under the Central and State Core Networks. The State Government has accordingly proposed.

### **1.3 Part-I: Guiding Principles of GTSNY Definitions**

- 1.** The spirit and the objective of the Gramin Tola Sampark Nischay Yojana (GTSNY) is to provide good all-weather road connectivity to the eligible unconnected Habitations having population more than 100 and are not mapped under Central or State Core Network.
- 2.** The unit for this Programme is a Habitation and not a Revenue village or a Panchayat. A Habitation is a cluster of population, living in an area, the location of which does not change over time.
- 3.** An **Unconnected Habitation** is one with a population of more than 100 and not connected by means of an All-weather road.
- 4.** The eligible Unconnected Habitations are to be connected to nearby habitations already connected by an All-weather road or to another existing All- weather road so that services (educational, health, marketing facilities etc.), which are not available in the unconnected Habitation, become available to the residents.
- 5.** A **Core Network** is that minimal Network of roads (routes) that is essential to provide Basic access to essential social and economic services to all eligible unconnected habitations in the selected areas through at least single all-weather road connectivity.
- 6.** A Core Network comprises of Through Routes and Link Routes. Through Routes are the ones which collect traffic from several link roads or a long chain of Habitations and lead it to Marketing centres either directly or through the higher category roads i.e., the District Roads or the State or National Highways. Link Routes are the roads connecting a single Habitation or a group of Habitations to Through Routes or District Roads leading to Market Centres. Link Routes generally have dead ends terminating on a Habitation, while Through Routes arise from the confluence of two or more Link Routes and emerge on to a major Road or to a Market Centre.
- 7.** The GTSNY shall cover only the rural areas.



8. The GTSNY envisages only single road Connectivity to be provided. If a Habitation is already connected by way of an All-weather road, then no new work can be taken up under the GTSNY for that habitation.
9. An All-weather road is one which is negotiable in all seasons of the year. This implies that the road-bed is drained effectively (by adequate cross-drainage structures such as culverts, minor bridges and causeways), but this does not necessarily imply that it should be paved or surfaced or black-topped.
10. GTSNY does not permit repairs to Black-topped or Cement Roads, even if the surface condition is bad as it is required to be taken under the concerned scheme under which the road lies.
11. The Rural Roads constructed under GTSNY will be in accordance with the existing CBR of the region and the different options chosen for the purpose which is as per the Appendix-1. However, the different options chosen are according to the provisions of Specification for Rural Roads and Specifications as given in the Rural Roads Manual (IRC:SP20:2002).

#### **1.4 Part II- Planning, Funding, Construction and Maintenance of Rural Roads** **Planning For Rural Roads**

1. Proper planning is imperative to achieve the objectives of the Programme in a systematic and cost effective manner. The Manual for the Preparation of District Rural Roads Plan and the Core Network shall be treated as part of the Guidelines and would stand amended to the extent modified by the present Guidelines. The identified unconnected habitations shall be incorporated in the State Core Network which shall form the basis for selection of project proposal.
2. The proposed new links shall be updated in the District Rural Roads Plan.
3. The Plan would first be prepared at the Block level, in accordance with the directions contained in the Manual and the priorities spelt out by the District Panchayat. In short, the existing road network would be drawn up, unconnected Habitations identified and the roads required to connect these unconnected Habitations prepared. This shall constitute the Block Level Master Plan.
4. Once this exercise is completed, the Core Network for the Block is identified.
5. Once the Core network is finalised, the priority list shall be formulated and shall form the basis for selection of road under consideration.

### **Funding**

1. The project will be implemented through state budget/ loan from any bilateral funding agency.
2. Rural Works Department shall transfer the aid amount in the form of Grant-in-Aid to Bihar Rural Roads Development Agency (BRRDA).
3. For this purpose BRRDA shall open an separate account in the bank and the amount made available for the scheme shall be pooled in it.

### **Construction/Execution of the Project**

1. The relevant projects would be executed by the PIUs and completed within a period of 12 months from the date of issue of the Work order. A Work Programme shall be obtained from the contractor for each work and approved by the PIU. Payment shall be made only after the approval of the work programme, deployment by the Contractor of the requisite number of engineers and setting up of the mobile Quality Control set up at site. In this connection, it is clarified that:
  - a. The period of 12 months shall comprise 12 working months. In case the period for execution is likely to be adversely affected by monsoon or other seasonal factors, the time period for execution may be suitably determined while approving the work programme, but shall not exceed 12 calendar months in any case.
  - b. However, no extra liability, if any, on account of cost escalation shall be allowed for the project.
  - c. Time period provided in the Notice Inviting Tender (NIT) and the Work Programme shall be strictly enforced. Since time is the essence of the contract, action must be taken against the contractor in cases of delay, as per the contract provisions.
  - d. The average time for finalising the tender is considered as 45 days.
  - e. To maintain quality, ensure timely completion of works and encourage rural road network maintenance, the Rural Works Department may lay down schemes of incentives / disincentives for the executing agency.
  - f. Provision of acquiring land for constructing the proposed road shall be made.

### **1.5 Quality Control Mechanism**

To keep the pace of contemporary requirements, RWD has set up an Quality Monitoring Cell to bring about innovative reforms and the best practices in enhancing the efficiency of the department. Quality Monitoring Cell is primarily being made operational to take care of all

the projects being taken up under the state scheme.

The QMC shall work on a three-tier quality management mechanism which is proposed to be operationalized with web based online system with centralised database for ensuring that the quality of assets created conform to the prescribed standards.

The proposed works under GTSNY shall come under ambit of Quality Monitoring Cell set up by the Department.

## **1.6 Proposed Options Based On the CBR of the Region**

Different options assumed are dependent on the CBR value of the region and shall be applicable for constructing all weather single connectivity to the uncovered habitation. This is as per IRC-62: Design of low volume roads, IRC-SP-20: Construction of Rural Roads & Specifications for Rural Roads (MoRD) and characterised as follows:

### **I. Less than 3 CBR (Black Cotton Soil):**

#### **Procedures to be adopted for construction:**

##### **Option-1**

- Excavation of existing earthen surface 200 mm deep.
- Earthwork required for profile correction only. OFL will be kept in mind rather than HFL.
- Provision of 300 mm Sub grade with suitable stabilization as per clause no.-403 of "Specification for Rural Roads by MoRD".
- Granular Sub base (Grading-II as per Table 400.1 of "Specification for Rural Roads by MoRD") of 150 mm.
- Cement Concrete Pavement (Grade-M30) of 190 mm thickness on the top.
- Provision of saucer drain depending on land availability.
- Cross Drainage Works such as Hume Pipe Culverts/Slab or Box Culverts/Submersible culverts shall be provided as per the topography and based on discharge of water. Since a non-bituminous road is proposed under this scheme, submergence at certain levels cannot be ruled out. Infact lighter submersible culverts can be a preferred option compared with high level CD structures.
- Further innovations in terms of life-cycle enhancement, durability and cost reduction can be allowed subject to approval from competent technical authorities.

##### **Option-2**

- Excavation of existing earthen surface 200 mm deep.

- Earthwork required for profile correction only.OFL will be kept in mind rather than HFL.
- Provision of 300 mm Sub grade with suitable stabilization as per clause no.-403 of "Specification for Rural Roads by MoRD".
- Granular Sub base (Grading-II as per Table 400.1 of "Specification for Rural Roads by MoRD") of 100 mm.
- Sand filling as leveling course of 50mm
- Concrete Paver blocks of 80 mm thickness (Conforming to IS-15658:2006 – Specifications for Precast Concrete blocks for paving) on the top.
- Provision of saucer drain depending on land availability.
- Cross Drainage Works such as Hume Pipe Culverts/Slab or Box Culverts/Submersible culverts shall be provided as per the topography and based on discharge of water. Since a non-bituminous road is proposed under this scheme, submergence at certain levels cannot be ruled out. Infact lighter submersible culverts can be a preferred option compared with high level CD structures.
- Further innovations in terms of life-cycle enhancement, durability and cost reduction can be allowed subject to approval from competent technical authorities.

## **II. For CBR > 3**

### **Procedures to be adopted for construction:**

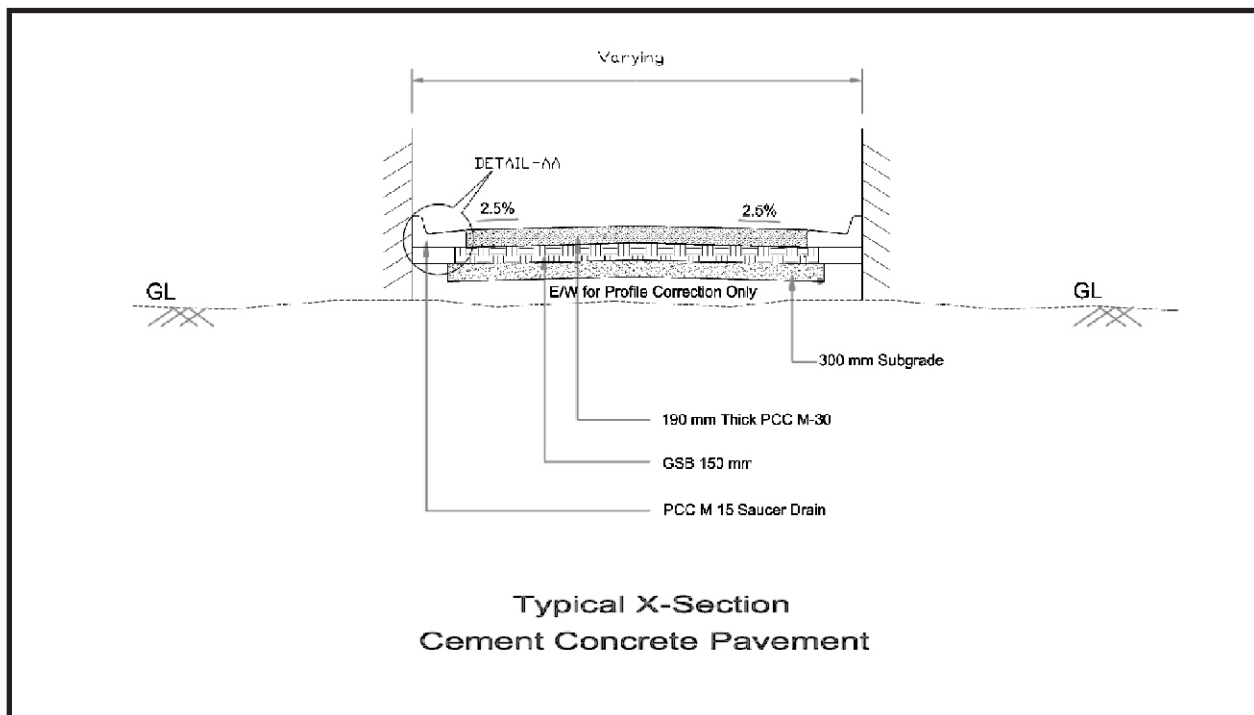
#### **Option-1**

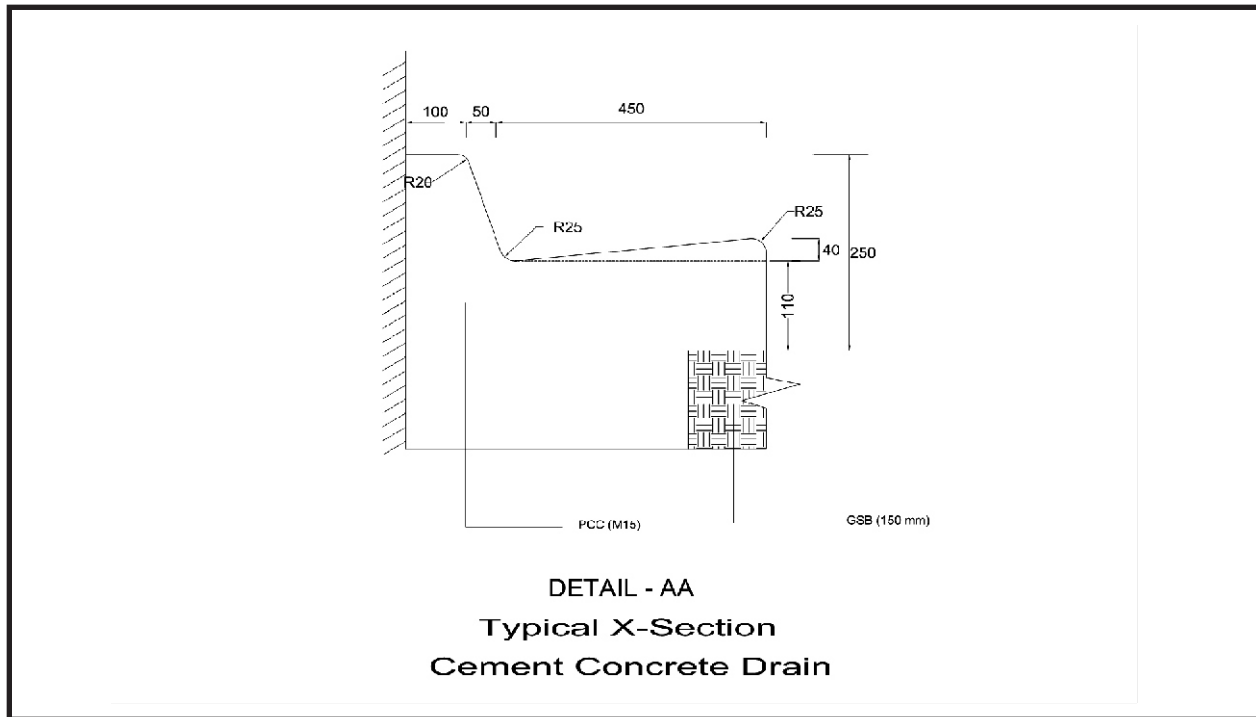
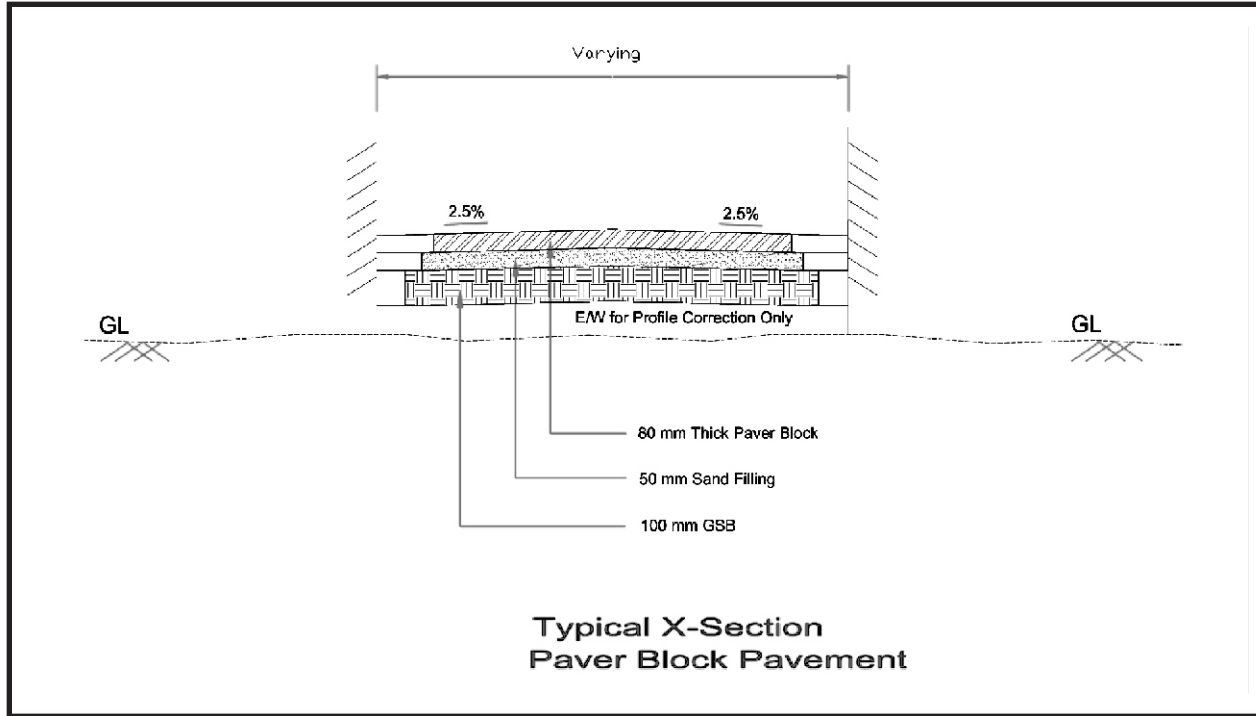
- Loosening & recompacting the original ground 150 mm deep.
- Provision of 300 mm Sub grade with as per clause no.-303 of "Specification for Rural Roads by MoRD".
- Granular Sub base (Grading-II as per Table 400.1 of "Specification for Rural Roads by MoRD") of 150 mm.
- Cement Concrete Pavement (Grade-M30) of 190 mm thickness on the top.
- Provision of saucer drain depending on land availability.
- Cross Drainage Works such as Hume Pipe Culverts/Slab or Box Culverts/Submersible culverts shall be provided as per the topography and based on discharge of water.Since a non-bituminous road is proposed under this scheme,submergence at certain levels cannot be ruled out.Infact lighter submersible culverts can be a preferred option compared with high level CD structures.

- Further innovations in terms of life-cycle enhancement, durability and cost reduction can be allowed subject to approval from competent technical authorities.

### Option-2

- Loosening & recompacting the original ground 150 mm deep.
- Provision of 300 mm Sub grade with as per clause no.-303 of "Specification for Rural Roads by MoRD".
- Granular Sub base (Grading-II as per Table 400.1 of "Specification for Rural Roads by MoRD") of 100 mm.
- Sand filling as leveling course of 50mm
- Concrete Paver blocks of 80 mm thickness (Conforming to IS 15658:2006– Specifications for Precast Concrete blocks for paving) on the top.
- Provision of saucer drain depending on land availability.
- Cross Drainage Works such as Hume Pipe Culverts/Slab or Box Culverts/Submersible culverts shall be provided as per the topography and based on discharge of water. Since a non-bituminous road is proposed under this scheme, submergence at certain levels cannot be ruled out. Infact lighter submersible culverts can be a preferred option compared with high level CD structures.
- Further innovations in terms of life-cycle enhancement, durability and cost reduction can be allowed subject to approval from competent technical authorities.





**1.7 Zoning of the Areas Based On Type of Soil and Average CBR**

Sl.	DISTRICT	DIVISION	BLOCK	TYPE OF SOIL	Av CBR
1	ARARIA	ARARIA	ALL BLOCK	FINE SAND	4
2		FORBESGANJ	ALL BLOCK	FINE SAND	4

3	ARWAL	ARWAL	ALL BLOCK	BLACK COTTON	3
4	AURANGABAD	AURANGABAD	ALL BLOCK	BLACK COTTON	3
		DAUDNAGAR	ALL BLOCK	SANDY CLAY	4
5	BANKA	BANKA-1	AMARPUR, SHAMBHUGANJ	BLACK COTTON SOIL	3.5-4
			BANKA, BELHAR, PHULLIDUMER	FINE SAND	4
		BANKA-2	BARAHAT, BOUNSI,CHANDAN,KATO RIA,RAJAUN	FINE SAND	4
			DHORAIYA	BLACK COTTON	3-3.5
6	BEGUSARAI	BALIA	ALL BLOCK	SANDY CLAY	4
		BEGUSARAI	ALL BLOCK	SANDY	4
		MANJHAUL	ALL BLOCK	SANDY	4
		TEGHRA	BACHHWARA,BHAGWAN	BLACK	3 TO 4
7	BHAGALPUR	BHAGALPUR	ALL BLOCK	BLACK COTTON	3
		KAHALGAON	ALL BLOCK	BLACK COTTON	4
		NAVGACHHIYA	ALL BLOCK	BLACK COTTON	4 4
8	BHOJPUR	ARA	AGIAON,ARA,UDWANTN	BLACK COTTON	3
			BARHARA	BLACK	3 TO 4
			KOILWAR	SANDY	4
		JAGDISHPUR	ALL BLOCK	SANDY CLAY	4
		PIRO	ALL BLOCK	SILTY CLAY	4
9	BUXAR	BUXAR	BUXAT,CHAUSA,SIMRI	SANDY	4-5
			ITARHI,RAJPUR	BLACK COTTON	3-4
		DUMRAON	BARHAMPUR,CHAUNGAI, DUMRAON,KESATH,NAW ANGAR	SANDY CLAY	4-5
			CHAKKI	SANDY	4-5
10	DARBHANGA	BENIPUR	ALL BLOCK	SANDY CLAY	4-5
		BIRAWL	ALL BLOCK	SANDY CLAY	4-5
11	GAYA	GAYA	FATEHPUR	MOORAM	6
			WAZIRGANJ	MOORAM	6
		IMAMGANJ	IMAMGANJ	MOORAM	6
		SHERGH	SHERGHATI	MOORAM	6

12	GOPALGANJ	GOPALGANJ-1	ALL BLOCK	SANDY CLAY	4-5
		GOPALGANJ-2	ALL BLOCK	SANDY CLAY	4-5
		HATHUA	ALL BLOCK	SANDY CLAY	4-5
13	JAMUI	JAMUI	JAMUI,KHAIRA, LAKSHMIPPUR	MOORAM	6
		JHAJHA	CHAKAI	MOORAM	6
14	KAIMUR (BHABUA)	BHABUA	ADHAURA	ROCKY	100
			BHABUA,BHAGWANPUR	50 % CLAY,50 % SANDY	3-4
			CHAINPUR,CHAND,RAMPUR	SANDY CLAY	4-5
15	KATIHAR	KATIHAR	FALKA	FINE SAND	4
16	KISHANGANJ	KISHANGANJ-1	ALL BLOCK	FINE SAND	4
		KISHANGANJ-2	ALL BLOCK	FINE SAND	4
17	MADHEPURA	MADHEPURA	ALL BLOCK	FINE SAND	4
		UDAKISUNGAN	ALL BLOCK	FINE SAND	4
18	MADHUBANI	JHANJHARPUR	MADHEPUR	FINE SAND	4
19	MUZZAFARPUR	MUZZAFARPUR	ALL BLOCK	SANDY	4
		MUZZAFARPUR	ALL BLOCK	SANDY	4
		MUZZAFARPUR	ALL BLOCK	SANDY	4
20	NALANDA	HARNAUT	THARTHARI	BLACK COTTON	3-3.5
		HILSA	EKANGARSARAI,KARAIP ARSURAI	BLACK COTTON	3-3.5
		RAJGIR	RAJGIR	MOORAM	6
21	NAWADA	RAJAULI	MESKOR, RAJAULI, SIRDALA	MOORAM	6
		BAGHA-1	ALL BLOCK	FINE SAND	6
22	PASCHIM CHAMPARAN	BETIA	BAIRIA,BETTIAH,JOGAP ATTI,MAJHULIA	SANDY CLAY	3-4
			NAUTAN	50% CLAY 50%	5
23	PATNA	BADH	ALL BLOCK	BLACK COTTON	3-3.5
		DANAPUR	ALL BLOCK	BLACK COTTON	3-3.5
		MASAURHI	ALL BLOCK	BLACK COTTON	3-3.5
		PALIGANJ	ALL BLOCK	BLACK COTTON	3-3.5
		PATNA	ALL BLOCK	BLACK COTTON	3-3.5



24	ROHTAS	DIHARI	AKORHI GOLA	CLAY	4
			DEHRI	SANDY CLAY	4-5
			NAUHATTA	MOORAM	6
			ROHTAS	SANDY+GRAVEL	6
			TILAUTHU	50% CLAY 50%	3-4
		SASARAM-1	CHENARI	60% BLACK	3-4
			KARGHAR,KOCHAS,SHEO SAGAR	BLACK COTTON	3-3.5
			SASARAM	BLACK COTTON	3-3.5
		SASARAM-2	KARAKAT, NASRIGANJ	SAND + CLAY	
NOKHA BLOCK	60 % BLACK		3-4		
25	SAHARSA	SAHARSA	ALL BLOCK	FINE SAND	4
		SIMRI	ALL BLOCK	FINE SAND	4
26	SAMASTIPUR	DALSINGHSAR	BIBHUTIPUR	25% BLACK	3-4
		AY	DAKSINGHSARAY, MORWA,SARAIRANJAN, UJIARPUR	SANDY CLAY	4-5
		PATORI	ALL BLOCK	SANDY CLAY	4-5
		ROSRA	ALL BLOCK	SANDY CLAY	4-5
		SAMASTIPUR	ALL BLOCK	SANDY CLAY	4-5
27	SARAN	CHAPRA-1	ALL BLOCK	SANDY CLAY	4-5
28	SHEIKHPURA	SHEKHPURA	SHEIKHPURA	SANDY CLAY	4-5
29	SITAMARHI	SITAMARHI	BATHNAHA, DUMRA, MAJORGANJ, PARIHAR, SONBARSA	SANDY CLAY	4-5
30	SUPAUL	SUPAUL	ALL BLOCK	FINE SAND	4
		TRIVEINGANJ	ALL BLOCK	FINE SAND	4
		VIRPUR	ALL BLOCK	FINE SAND	4
31	VAISHALI	MAHUA	ALL BLOCK	SANDY CLAY	4

### 1.8 Requirement of Equipments for site Inspection

The following Man Power & Equipments are required for making the Observations during the inspection of a roadwork.

1. One or two unskilled labourers are required to dig the pit and collect the samples of the material depending upon the work involved.
2. In addition, the following equipments shall also be required.

#	Observation	Method of Observation	Equipments/ Implements Required
1	2	4	6
<b>Item – Geometrics</b>			
1	Width	Actual Measurement	Measuring tapes of 20m, thread, spirit level and straight edge.
2	Camber		
3	Horizontal Curve, Super elevation and Extra widening		
4	Longitudinal Gradient		
<b>Item – Earth Work and Sub-grade in Embankment</b>			
1	Quality of Material	Visual Classification of Soils	Visual Observation
2	Compaction	Field Density Test by sand replacement/ Core Cutter method	Rapid Moisture Meter, Sand Replacement Test/ Core Cutter Apparatus
<b>Item – Sub-Base</b>			
1	Quality of Material		
	a. Grain Size	Gradation Test	Standard Sieves
	b. Plasticity	Hand-feel test.	
2	Compaction	Field Density Test by sand replacement/ Core Cutter method.	Rapid Moisture Meter, Sand Replacement Test/ Core Cutter Apparatus.
3	Total Thickness of Layer	Measurement	Measuring Tape and Steel Scale of 30cm.
<b>Item – Rigid Pavements and Associated Pukka drains</b>			
1	Thickness of Layer	Measurements	Steel Scale of 30cm.

## 1.9 Aspects to be checked:

**1.9.1 Setting Out and Working Drawing:** For systematic execution of work, appropriate setting out and availability of proper working drawing is to be ensured by PIU. The IE/PQM is required to see as to whether, appropriate setting out as required for the item of work ongoing at the time of inspection of IE/PQM is in place or not. The following aspects need to be seen:

- (a) **Bench Marks:** As per specifications, the contractor is required to establish at least 4 reference bench marks per kilometer as also at or near all CD works. The levels of these reference bench marks are required to be approved by the engineer. The IE/PQM is required to see as to whether, these bench marks exist and up-to-dated records of bench marks including approved adjustment have been maintained.
- (b) **Center Line:** Center line of the carriageway is required to be accurately established by the contractor and referenced through marker pegs and chainage board appropriately placed at defined intervals. The IE/PQM shall check these markings.
- (c) **Working Drawing:** At every work site, clear working drawing having pre-commencement levels and levels of various items of work to be achieved after completion is required to be made available to the contractor. The IE/PQM is expected to check the working drawing in reference to the level of execution at the time of inspection.

**Frequency:** At all stages of inspection, the IE/PQM shall check the above aspects and record his observations.

**Grading:** If the PIU has not established Bench Marks or Center Line or not provided proper Working Drawing, 'U' grade would be awarded. If the above items have been carried out partially, 'SRI' grade would be awarded, otherwise, if all the items have been properly executed, 'S' grade would be awarded.

**1.9.2 Site Clearance and Grubbing:** As per specifications, clearing and grubbing is required to be supervised by the PIU. The IE/PQM is expected to see as to whether clearance and grubbing as provided in the Detailed Estimate is being carried out and disposal of material as provided in the specifications is being done..

**Frequency:** In Stage-I of inspection, the IE/PQM shall check the above aspect and record his observations.

**Grading:** If the PIU has got the clearing and grubbing properly and has appropriately reused the salvageable material, 'S' grade would be awarded. If the above items have been carried out partially, 'SRI' grade would be awarded, otherwise, if the above items have not been properly executed, 'U' grade would be awarded.

**1.9.3 Quality Control Arrangements and Attention to Quality:** As per the contract, the contractor is required to establish the field laboratory for conducting mandatory quality control tests for material and workmanship. The IE/PQM is expected to check whether the requisite equipments for the testing of various item(s) of works ongoing at the time of inspection are there in the laboratory or not. This is also required to be seen that whether equipments are being used to actually for testing material and workmanship and clear observations on this aspect are to be recorded.

IE/PQM is required to list out various items of works and quantities executed. Based on the prescription about mandatory tests, the IE/PQM shall also list out various tests and their numbers for each item of work executed by the PIU. It is mandatory to maintain the Quality Control Register Part-I & II. In case of ongoing works the IE/PQM is expected to see, as to whether, appropriate entries in the abstract of Quality Control Register have been made, whether, test results for all the items of work executed upto the time of inspection are available in the Quality Control Register Part-I. In Quality Control Register Part-II it is required to be seen that whether record of non-conformance is being maintained and whether appropriate non-conformance report have been issued.

**Frequency:** At all stages of inspection, the IE/PQM shall check the above aspects and record his observations.

**Grading:** If field laboratory with sufficient equipments has been established and equipments are being used, record of tests is properly maintained and monitored through Quality Control Register Part I and II, all the tests as per prescribed frequency have been carried out 'S' grade would be awarded. If, any of the above items have been partly attended 'SRI' grade would be awarded and if, any of these items have not been attended by PIU 'U' grade would be awarded.

**1.9.4 Geometrics:** Under this item, the observations about road land width, road way width, carriage way width are required to be made and reported at various stages of construction

at selected RDs. Geometrical features such as camber, super elevation, horizontal curves, requisite transition curves and extra widening are required to be provided right from the levels of the sub-grade up to construction of bituminous layer. However, the observations about these geometric elements shall be recorded by the IE/PQM in each stage of inspection.

If, it is felt that the provisions about camber, super-elevation, extra widening etc. has not been made in DPR but are required as per field conditions, in such cases, clear observations should be made in the space provided under 'General Observations' at the end of reporting format.

**Frequency:** At all stages of inspection, the IE/PQM shall check the above aspect at a frequency of 2 per km except for super-elevation and extra widening at curves, which would be checked on at least 1 curve in each km and record his observations.

**Grading :** If the all the items of geometrics have been executed properly as provided in DPR 'S' grade would be awarded otherwise 'U' grade would be awarded.

**6.5. Earthwork:** The road may be in either cutting or in embankment or there may be a combination of cutting and embankment in the same road. The observations about the quality are to be made for all the above types of works.

**(a) Earthwork in Embankment and Sub-grade:** For embankments and sub-grade, the following parameters are critical to quality of material and workmanship:

- Quality of Soil used in embankment or sub-grade (Soil Classification)
- Compaction of embankment or sub-grade.
- Side slopes and profile upon completion.

The IE/PQM would be required to ascertain conformance of above parameters with the specifications. Appropriate hand-feel test for soil classification and test for field density at various levels of embankment are expected while the work is ongoing. These observations can also be made by digging appropriate pit in cases where embankment has been completed and the work of sub-base and base-course is ongoing. The IE/PQM is expected to make the above observations while the work in this item is ongoing. If, execution of this item has been completed and somehow the sufficient observations had not been made during the execution of this item, the IE/PQM shall make observations about this item by digging pit after completion of embankment.

**Frequency:** The IE/PQM shall perform the tests as given below:

Test	Frequency
Visual Classification of Soil.	In Stage-I, at least 1 test for earthwork in each km (irrespective of the executed quantity).
	In Stage-II or III, if earthwork of the stretch of road has not been monitored earlier, at least 1 test for earthwork in each Km
Degree of Compaction	In Stage-I, minimum 2 tests for each km length or part thereof (irrespective of the executed quantity).
	In Stage-II or III, if earthwork of the stretch of road has not been monitored earlier, minimum 2 tests for each km length or part thereof (irrespective of the executed quantity).
Side Slopes, Profile	2 per km in Stage-III.

**Grading:**

**Material –** If suitable soil has been used, 'S' grade would be awarded otherwise 'U' grade would be awarded.

**Compaction –** If degree of compaction is within the prescribed limits 'S' grade would be awarded otherwise 'U' grade would be awarded.

**Side Slopes –** In case work is nearing completion or has been completed and if side slopes and profile is as per provisions 'S' grade would be awarded otherwise 'U' grade would be awarded.

**(b) Earthwork in Cutting:** The roads in hilly areas and rolling terrain may have earthwork in cutting. The following parameters are critical to quality of earthwork in cutting:

- Longitudinal gradient and
- Slopes of cutting and stability.
- Adequacy of slope protection
- In case of only formation cutting, dressing and traffic worthiness of completed formation.

The IE/PQM is expected to make clear observations on the basis of actual recording of levels in the stretches fairly representative of the overall quality.

**Frequency:** The IE/PQM shall record observations as given below:

Test	Frequency
Stability and workmanship of Slope Cuttings	At all stages of inspection in case of work of formation cutting – At least two critical locations with maximum height in each kilometer stretch of road (irrespective of the executed quantity)
Adequacy of slope protection	In general, IE/PQM shall check and record.
Recording of Longitudinal Levels	At all stages of inspection in case of work of formation cutting – In a critical and fairly representative stretch of 200 meters in each kilometer (irrespective of the executed quantity)

**Grading:** If the **longitudinal gradient and slope of cutting** is as per provisions having adequate stability, 'S' grade would be awarded, if improvement is possible with respect to slope and stability of cuts, 'SRI' grade would be awarded otherwise 'U' grade would be awarded.

**6.6. Sub Base Course and Shoulders:** Specifications provide for course-graded granular sub-base for rural roads. Recently, gravel sub-base has also been allowed. For monitoring the quality of GSB, the following quality parameters are critical:

- The conformance of the material to grading requirements and also to ensure that soil fraction passing through 75 micron sieve is not more than the prescribed percentage.
- Plasticity characteristics of the fraction passing through 425 micron sieve are well within the prescribed limits.
- Compaction.
- Thickness of compacted layer.

The IE/PQM is expected to carry out actual field tests for all the above items for samples fairly representative of overall quality of the item.

**Frequency:** The IE/PQM shall record observations as given below:

Test	Frequency
Gradation Test	In Stage-II, at least 1 test for each Km (irrespective of the executed quantity)
	In Stage-III, if gradation of GSB of the stretch of road has not been monitored, atleast 1 test for each Km

Test for Liquid Limit & Plasticity Index	In Stage-II, at least 1 test for each Km ( irrespective of the executed quantity)
	In Stage-III, if gradation of GSB of the stretch of road has not been monitored, atleast 1 test for each Km
Degree of Compaction	In Stage-II, at least 1 test for each Km or part there of (irrespective of the executed quantity)
	In Stage-III, if gradation of GSB of the stretch of road has not been monitored, atleast 1 test for each Km or part there of.
Thickness of compacted Layer	In Stage-II or III, in case, GSB is complete and if every km not monitored for quality, at least 2 test per km.

**Grading for GSB: Material** – If suitable GSB material has been used, 'S' grade would be awarded otherwise 'U' grade would be awarded. **Compaction and Thickness of Layer** – If degree of compaction is within the prescribed limits and thickness of the layer is as provided in DPR, 'S' grade would be awarded otherwise 'U' grade would be awarded.

**6.7 Shoulders:** For shoulders, appropriate material, as provided in the DPR, is to be used and construction of the shoulder has to take place simultaneously with construction of other layers of pavements. For monitoring the quality of shoulders the following quality parameters are critical:

- Quality of material.
- Compaction.
- Thickness of compacted layer.
- Simultaneous construction and compaction of shoulder with other layers of pavement.

The IE/PQM is expected to carry out actual field tests for all the above items for samples fairly representative of overall quality of the item.

**Frequency:** The IE/PQM shall record observations as given below:

Quality of Material	In Stage-II, at least 1 test for each Km (irrespective of the executed quantity)
	In Stage-III, if gradation of GSB of the stretch of road has not been monitored, atleast 1 test for each Km
Degree of Compaction	In Stage-II, at least 1 test for each Km or part there of (irrespective of the executed quantity)
	In Stage-III, if gradation of GSB of the stretch of road has not been monitored, atleast 1 test for each Km or part there of.
Thickness of compacted Layer	In Stag-II or III, in case, GSB is complete and if every km not monitored for quality, at least 2 test per km.



**Grading for Shoulder: Material** – If material as provided in the DPR has been used, 'S' grade would be awarded otherwise 'U' grade would be awarded.

**Compaction, Thickness of layer and Simultaneous Construction with Sub-base and Base Course** – If degree of compaction is within the prescribed limits and thickness of the layer is as provided in DPR and shoulder is being constructed, simultaneously with sub-base or base course, 'S' grade would be awarded otherwise 'U' grade would be awarded.

**6.8 Cross Drainage Works:** There are a variety of CD works, taken up under PMGSY. Quality monitoring requirements for some common types of CD works are given below:

**(a) Hume Pipe Culverts and Vented Cause-way:** The following aspects are critical for quality of hume pipe culverts:

- Adequacy of provision for face/main walls, wings and return walls has been made as per site conditions (whether these walls provided with appropriate design in appropriate length etc).
- Quality of material and workmanship of face/main walls, wing and return walls.
- Quality of hume-pipes
- Adequacy of cushion over hume-pipes.
- In case of vented cause-ways, quality and workmanship of surfacing over vented cause-way (generally, CC Pavement is constructed and quality monitoring as covered under CC Pavement would apply to this item also).

While the work is ongoing the IE/PQM shall check all the above aspects and report. In case of completed hume-pipe culverts also the above aspects can be checked and reported. In case of cause-ways, it is important to check, as to whether; main walls have been appropriately keyed on the banks of the drain taking them well beyond HFL to avoid out-flanking in high floods. The IE/PQM shall make observations on all the above aspects during his inspection and report.

**6.9 Cement Concrete/ Semi Rigid Pavement and Associated Pucca Side Drains:** In case of cement concrete and other semi rigid pavements, the following are critical to quality:

- Quality of cement concrete
- Workmanship of cement concrete
- Joints
- Thickness
- Size and Shape of associated pucca side drains and their adequacy
- Quality and Workmanship of material used in pucca side drains

- Longitudinal levels of pucca side drains, their integration to cross drains or appropriateness of the provisions for disposal.
- Cross drainage works

While the work is ongoing, the IE/PQM is expected to verify all the above items however, while the work is complete, measurements about the thickness of CC Pavement, Surface conditions such as cracking etc may visually be seen, the register of cube test may be verified and based on visual observations, comments on quality of material and workmanship may be made. The aspects of size and shape of associated pucca side drains and their adequacy, Quality and Workmanship of material used in pucca side drains and Longitudinal levels of pucca side drains, their integration to cross drains or appropriateness of the provisions for disposal may be observed and recorded even if the work is complete. The SQM/MQMU shall make observations about the above aspects during his inspection and report.

**Grading:** If quality of material and workmanship is as per provisions grade 'S' would be given. Otherwise 'U' would be given.

**6.10 Road Furniture and Markings:** Under the scheme, every work is to be provided with Logo Information Board even before the actual grounding of the work. Logo boards and other road furniture are to be provided at appropriate time.

**Grading:** If quality of material and workmanship is as per provisions grade 'S' would be given. Otherwise 'U' would be given.

**6.11 Observations on action regarding issues mentioned in earlier inspection reports of IE/PQM:**

If the work being inspected by the IE/PQM was earlier inspected by other IE/PQM, the IE/PQM shall make item and sub-item wise observations on the action by the PIU regarding issues mentioned in reports of earlier inspections by IE/PQM and record these observations in the relevant item of work.

**7. Sub-item/Item wise Grading and Overall Grading of Work:**

Sl. No.	Road Items	Available Grade
1	Quality Control Arrangements	
2	Attention to Quality	
3	Geometrics	
4	Earthwork and Sub-grade in Embankment/Cutting	
5	Granular sub-base	

6	CC/Semi-Rigid Pavement	
7	Shoulders	
8	CD Works	
9	Road Furniture and Markings	
<b>Overall Grading</b>		

The sub-item wise grading of every item of work would be entered. The overall Item Grading would be entered and shall be calculated in the following manner:

Grading shall be of 3 types vis-a-vis:

1. Unsatisfactory. (U):

If, any of the items in item no. 3, 4, 5 and 6 are graded as 'U', overall grading of the work shall be **'U' i.e. 'Unsatisfactory'**.

2. Satisfactory but requires Improvement. (S-RI)

If, all the items given in above four items are 'S' but grading in any of other items is 'U' or 'RI', the overall grading of work shall be **'S-RI' i.e. Satisfactory but Requiring Improvement.**

3. Satisfactory. (S)

If grading of all items is 'S', the overall grading of work shall be **'S' i.e. "Satisfactory"**.

**7. Digital Records of Inspections:** Under the second tier of quality monitoring the State Quality Monitor and the PIU shall also ensure digital photography of the observations on quality of material and workmanship of the road in each inspection. The photography shall be arranged by the PIU. It would be ensured by the PIU that the quality of digital photographs should be good and display the issues pertaining to quality of material and workmanship. Hard copy and soft copy of digital photographs would be attached by the IE/PQM with the report.

**8. Submission of Hardcopy of Reports by IE/PQM:** The IE/PQM is expected to fill up the majority of observations in the prescribed formats during the inspection itself, however, in some items, in which the test results may take some time, the observations may be filled up latest by the next day. Immediately upon completion of the inspection but in all cases

before the IE/PQM leaves the district where he has performed inspection, he shall deliver the inspection report to the concerned PIU and send a copy to HQ.

**9. Action on IE/PQM Observations and Grade Improvement:** Upon receipt of the inspection reports and observations of IE/PQM, the PIU shall initiate action (if required) for rectification of defects (if any) pointed out in the observations. This shall be ensured by the PIU that an Action Taken Report (ATR) is furnished to the HQ within 30 days of inspection. The HQ shall scrutinize the ATRs with reference to the observations of IE/PQM in the inspection report. The HQ shall make his observations on the ATRs and communicate them to PIU for necessary action. The process of verification of Action Taken Reports in the second tier would be carried out in the following manner:

- (a) Every work is to be inspected thrice during its execution, therefore, if there are any adverse observations about quality, the PIU is required to rectify and report to HQ, however, the physical verification of the action taken should be done in the next inspection.
- (b) Quality grading of work in the last inspection of IE/PQM would be considered and effect of earlier quality grading would not be taken into account subject to condition that if in earlier inspections, the work has been graded as 'SRI' or 'U' and the action for rectification is taken by the PIU followed by verification of action taken report by the IE/PQM.
- (c) If work is observed 'Unsatisfactory' upon completion, the State would not be able to accept the work and the PIU would be required to carry out rectification and get the work re-inspected.

In view of the above, the improvement in quality grades awarded under second tier of quality mechanism would not be required.

**11. Selection and Performance Evaluation of State Quality Monitors:** It is important to structure the Departmental/Independent Quality Monitoring in such a way that actual field realities are brought out, however, it is more important to ensure that the Departmental/independent monitors is correct and they are carry out inspections properly and report truthfully. Therefore, the HQ would evolve appropriate mechanism for selection and periodic review of performance of State Quality Monitors.

## Do's & Don'ts

### Earthwork

Do's	Don'ts
<p>1. Discourage borrow pits along the road.</p>	<p>1. Do not allow borrow pits within a distance equal to the height of the embankment subject to a minimum of 1.5 m from the toe of the road embankment.</p>
	<p>2. Do not allow borrow pits within 800 m of towns or villages.</p>
<p>2. Do maintain a camber/ cross fall of 4 percent during construction for effective drainage and prevention of ponding of water.</p>	<p>3. Do not use unsuitable material for embankment construction</p>
	<p>4. Do not allow construction or other vehicular traffic over the prepared surface of embankment/ sub-grade.</p>
<p>3. The area of the embankment foundation should be kept dry. Test the material (soil) for its suitability for use in the embankment at least seven days before commencement of earthwork. Tests should include Soil classification test data and data regarding maximum dry density, OMC, and CBR4. For widening of existing embankment start earth work from toe line.</p>	<p>5. Do not place successive layers of embankment until the previous layer has been thoroughly compacted and duly approved by Engineer.</p>
<p>4. For widening of existing embankment start earth work from toe line</p>	<p>6. Do not allow any damage to works, crops or other property while discharging stagnant water found in embankment foundation.</p>
	<p>7. Do not allow dumping of earth from top to widen an existing embankment.</p>

### **Earthwork in Cutting**

<b>Do's</b>	<b>Don'ts</b>
1. Remove water, if met during excavation.	1. Do not remove the bench marks, reference lines, stakes etc. used for setting out of works without informing the Engineer.
2. Rocks and boulders, which are likely to cause differential settlement, should be removed to the extent of 500 mm below the formation level.	2. Do not let the loose material/ debris remain on the slopes of cutting/ along the road.
3. Take precautions during construction to ensure stability and safety of slopes.	3. Do not allow the rock to protrude above the formation level at any point.
4. Near village settlements, trenches and foundation pits should be securely fenced and provided with caution signs in the interest of public safety.	4. Do not stack stone boulders on embankment to ensure free flow of traffic especially on hill roads.
5. Ensure that unsuitable and surplus material from cuttings is disposed of as directed by the Engineer.	5. Do not throw the debris on the valley side to avoid damage to property/ environment.
6. Ensure that proper longitudinal gradients as per drawings have been achieved.	

### **Lime Treated Soil for Improved Sub-grade/Sub-base**

<b>Do's</b>	<b>Don'ts</b>
1. Use lime with purity not less than 70% by weight of Calcium Oxide.	1. Do not allow the spread lime to be blown away.
2. Ensure uniformity of mixing of lime with soil by mechanical means like tractor-towed rotavator.	2. Do not accept the completion of the mixing process if any white streaks or pockets of lime are visible.

3. Look for soft patches, if any, and rectify them by removing or adding fresh material and compacting the same thoroughly.	3. Slaked lime supplied in airtight bags should not be stored for more than 3 months.
	4. Do not allow any traffic other than mixing equipment to pass over the spread lime till mixing has been completed.
	5. Do not allow traffic until the lime treated layer is cured for atleast 7 days.

### **Brick Work for Structures**

<b>Do's</b>	<b>Don'ts</b>
1. Soak all bricks for a minimum period of one hour before use and remove from tank sufficiently in advance so that they are skin dry before actual laying.	1. Do not use sand containing dust lumps
2. For curing purpose, use vats for at least 24 hours.	2. Do not use cement mortar 30 minutes after addition of water or initial setting whichever is earlier
3. Use bricks of rectangular faces with sharp corners	3. Do not use brick bats or cut bricks except to obtain dimensions of different courses.
4. Mix Cement mortar in a mechanical mixer operated manually or by power for large works.	4. Do not start masonry work earlier than 48 hours of casting foundation block.

### **Pipe Culverts**

<b>Do's</b>	<b>Don'ts</b>
1. Provide adequate cushion over the pipe culvert.	1. Do not allow humps or dips in the vertical profile of the road at the location of pipe culverts.

2. Keep the trenches free from water until the pipes are installed and joints hardened.	2. Do not use defective pipes or those found damaged during laying.
3. Maintain a longitudinal slope of pipe not flatter than bed slope to ensure self cleaning (suggested minimum value 1/100).	3. Do not permit traffic unless the depth of earth filling above the top of pipe line is at least 600 mm.

### **Cement Concrete Pavement**

<b>Do's</b>	<b>Don'ts</b>
1. Curing for at least 7 days by moist jute bags or rice husk	1. Do not lay sub-base on a sub grade softened by rain
2. Saw cutting of joints should be done when concrete is neither too soft nor too hard.	2. Do not expose concrete slab for a period of more than half an hour for saw cutting of joints.
3. Do make provisions to maintain sufficient supply of tarpaulin or other water proof cloth during placement of concrete when rain is expected.	3. Do not carry out concreting work when concrete temperature is more than 30 Deg C or less than 5 Deg C at the point of placing and ambient temperature is greater than 35 Deg C
4. The Coarse aggregate shall be free from dirt	4. Do not vibrate concrete excessively to prevent flow of mortar to the top.
5. Use fine aggregate free from soft particles.	5. Do not walk on freshly laid concrete to place covering for curing.
6. Measure workability of the concrete at the time of placing with slump cone Test.	6. Do not allow any traffic, including construction vehicles on the finished surface of concrete pavement till the joints are permanently sealed.



## **Maintenance**

<b>Do's</b>	<b>Don'ts</b>
1. Do carry out suitable benching of the rain cuts to be restored, as per the specified procedure.	1. Do not use any soil for restoring rain cuts, which does not meet the requirements for suitability as a fill material.
2. The deficiency in shoulder thickness should be made up in layers, ensuring the optimum moisture for compaction and achieving the specified density.	2. Do not allow any obstructions to remain on the shoulders
3. The compacted layers on the shoulder should be finished to the required cross-fall.	3. Do not spread the excess material over the road surface while reshaping, regarding and deepening of ditches.
4. Do make provisions to maintain sufficient supply of tarpaulin or other water proof cloth during placement of concrete when rain is expected.	4. Do not attempt turfing or seeding on soil type, which will not sustain plant growth, without providing topsoil.
5. While reshaping/regrading and deepening of ditches/drains, carefully check and correct the invert level and grading.	5. Do not use any chemical methods or resort to burning to control roadside vegetation.
6. Before turfing or grass-seeding, get the needed advice from the local agriculture department.	

## **Drains**

- Ensure that the surface drains/roadside ditches are provided strictly according to the Drainage Plan for the road.
- Provide safe outlets to natural or artificial water courses.
- Remove all excavated material from the area adjoining the drains.
- Ensure that the excavated bed and sides of the drains are in conformity with the specified dimensions, levels and slopes.
- Provide proper gradients for quick disposal of water to the outfall.

- For any stretch of the rural road passing through a built-up area, ensure that any water coming from the adjacent habitations discharges only into the drain and is not allowed to flow over the road surface or back to the houses by providing Non Return Valve.

<b>Do's</b>	<b>Don'ts</b>
1. Ensure that the gradients are adequate for free flow of water to the outlet without overflowing or ponding or undue siltation.	1. Do not provide ordinary side slopes steeper than 2:1 to avoid damage by erosion.
2. Take special precautions in built-up areas to make sure that water from any adjacent habitations does not flow over the road..	2. Do not allow the bottom of roadside ditch/drain to be below the bed of the cross-stream at an outlet.

# खण्ड—VII

सूचना पट



# GRAMIN TOLA SAMPARK NISHCHAY YOJNA (GTSNY) INFORMATORY SIGN BOARD



From:.....	To:.....
Length:.....	Construction Cost: Rs..... Lac
	Maintenance Cost:Rs.....Lac
Date of Commencement:.....	Date of Completion:.....
	Period of Guarantee by Contractor: 5 Years
Name and Address of Contractor:.....	
.....	
Name and Address of Officer in Charge:	
.....	
<b>Project Funded by Rural Works Department, Government of Bihar</b>	

**Size**

- Size of board will be 1500mm x 900mm
- To be fixed at starting point of road.  
One board for one road upto 5 km. If road length is more, one additional board at finishing point of road.
- Bottom border in black colour will be used for writing slogan to be provided by the Rural Works Department.

GRAMIN TOLA SAMPARK NISHCHAY YOJNA (GTSNY)  
**INFORMATORY SIGN BOARD**

GRAMIN TOLA SAMPARK NISHCHAY  
YOJNA

Name: .....

Total Length:..... Km. Cement Concrete Road:..... Km.

Pucca Side Drain: Length..... m.

**Details of Concrete Road Pavement**

**1. Sub-base:**.....Cu.m. (Equivalent to.....trucks).  
 Watered and Rolled.  
 Pit Gravel.....Cu.m. (Equivalent to.....trucks)  
 Metal/River Gravel.....Cu.m. (Equivalent to.....trucks)  
 Stone Dust.....Cu.m. (Equivalent to.....trucks)

**2. Cement Concrete Pavement:**.....Cm. thick.  
 Metal.....Cu.m. (Equivalent to.....trucks)  
 Sand.....Cu.m. (Equivalent to.....trucks)  
 Cement.....Bags.

**3. Side Drain:**

**BOARD 'B'**