

પ્રતિ,

૧. અંગત સચિવશ્રી, સચિવશ્રીનું કાર્યાલય, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર
૨. અંગત સચિવશ્રી, સચિવશ્રીનું કાર્યાલય, નર્મદા, જળસંપત્તિ પાણી પુરવઠા અને કલપસર વિભાગ, સચિવાલય, ગાંધીનગર
૩. અંગત સચિવશ્રી, અગ્રસચિવશ્રીનું કાર્યાલય, આરોગ્ય અને પારિવાર કલ્યાણ વિભાગ, સચિવાલય, ગાંધીનગર
૪. અંગત સચિવશ્રી, અધિક મુખ્ય સચિવશ્રીનું કાર્યાલય, રહેણી વિકાસ અને ગહેરી ગૃહ નિર્માણ નિભાગ, સચિવાલય, ગાંધીનગર
૫. અંગત સચિવશ્રી, અગ્રસચિવશ્રીનું કાર્યાલય, પંચાયત, ગ્રામ ગૃહનિર્માણ અને ગ્રામ વિકાસ વિભાગ, સચિવાલય, ગાંધીનગર
૬. એક્ઝિક્યુટિવ જનરલશ્રી, રાજકોટ/અમદાવાદ
૭. સર્વે મુખ્ય ઇજનેરશ્રીઓ, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર
૮. સર્વે મુખ્ય ઇજનેરશ્રીઓ, નર્મદા, જળસંપત્તિ પાણી પુરવઠા અને કલપસર વિભાગ, સચિવાલય, ગાંધીનગર
૯. મેનેજીંગ ડીરેક્ટરશ્રી, ગુજરાત રાજ્ય માર્ગ વિકાસ નિગમ, નિર્માણભવન, ગાંધીનગર
૧૦. મુખ્ય ઇજનેરશ્રી અને કાર્યદેશકશ્રી, સ્ટાફ ટ્રેનીંગ કોલેજ, ગાંધીનગર
૧૧. કાર્યદેશકશ્રી, ગુજરાત એન્જીનીયરીંગ રીસર્ચ ઇન્સ્ટીટ્યુટ (ગેરી), વડોદરા
૧૨. ઉપસચિવશ્રી, ગુજરાત તકેદારી એજીઓ, તકેદારી-અધીન, ગાંધીનગર
૧૩. નાણાં સલાહકારશ્રી, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર
૧૪. સર્વે અધિકારક ઇજનેરશ્રીઓ, માર્ગ અને મકાન વિભાગ (રાજ્ય, પંચાયત, ને.કા., પાટનગર ચોજના વર્તુળ, વિદ્યુત વર્તુળ સહિત)
૧૫. સર્વે કાર્યપાલક ઇજનેરશ્રીઓ (ઉકેલ વર્તુળ હેઠળના)
૧૬. સર્વે તાંત્રિક અધિકારીશ્રીઓ, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર
૧૭. સર્વે તાંત્રિક શાખાઓ, માર્ગ અને મકાન વિભાગ, સચિવાલય, ગાંધીનગર
૧૮. પ્રમુખશ્રી, ગુજરાત કોન્ટ્રાક્ટર્સ એસોસિએશન, ગંજજરા હોલ, લો ગાર્ડન, લો કોલેજ રોડ, અમદાવાદ
૧૯. શાખા સીલેક્ટ કાઉન્સિલ-૨૦૧૭

અધીક્ષી-૨/પીબી

અધિકારક ઇજનેર શ્રી,
અધિકારક મા.વ. વિભાગ
અસેલી/ભાવનગર/પુલગઢ/પોરબર/ગીર/ગીર
ગીર રીનવાણ

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૦૩/૫/૧૭

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૬૪૫૬

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
અધિકારક ઇજનેરની સહી :

STANDARDS FOR CEMENT
CONSUMPTION FOR DIFFERENT
ITEMS OF WORK

Government of Gujarat
Roads & Building Department,
Circular No.PRC/10/2017/Cement Consumption/16/c
14,Sardar Bhavan,2nd Floor,
Sachivalaya,Gandhinagar

Date:-11/05/2017

Read:-Government of Gujarat, Road & Building Department, Sachivalaya, Gandhinagar
Circular No. SOR/1085/7/H(1) dated 08/12/1996

CIRCULAR

The uniform rate of cement consumption for various item was prepared and circulated vide No.SOR/1085/7/H(1)dated 08/12/1996.

At the outset, current practice of estimating cement consumption in concrete item of various Building and Road project is based on above circular.However,it is generally observed that the cement consumption derived by actual mix design is lower than the standard cement consumption. Some of provision of the said circular become obsolete due to subsequent revisions in the relevant IS code and IRC code. The maximum cement consumption as per IS:456-2000 and IRC :112-2011 is 450 kg./m³.Also cement industry and aggregate over the years which have far reacting impact on mix design of the present day concrete.

Mix design report of GERI reflecting entire Gujarat region have been considered in averaging the cement consumption in various grade of design mix concrete. To minimize the different between standard cement consumption of cement and actual consumption derived by mix design by GERI and the cement consumption as per provision of IS and IRC code falling cement consumption is proposed is proposed for estimation purpose.

Looking the above facts, the cement consumption mentioned in circular vide No.SOR/1085/7/H(1)dated 08/12/1986 is required to modify as per below:

EXISTING ITEM			AMENDMENT		
Item	Unit	Quantity of cement to be used per unit quantity of work in Kg	Item	Unit	Quantity of cement to be used per unit quantity of work in Kg
Building Road & Bridge Items					
Providing & casting in situ ordinary cement concrete M75 for PCC work	Cu.m.	160	Providing & casting in situ ordinary cement concrete M7.5 for PCC work	Cu.m.	160
Providing & casting in situ ordinary cement concrete M100 for PCC work	Cu.m.	220	Providing & casting in situ ordinary cement concrete M10 for PCC work	Cu.m.	220
Providing & casting in situ ordinary cement concrete M150 for PCC work	Cu.m.	320	Providing & casting in situ ordinary cement concrete M15 for PCC work	Cu.m.	290
Providing & casting in situ ordinary cement concrete M200 for RCC work	Cu.m.	400	Providing & casting in situ ordinary cement concrete M20 for RCC work	Cu.m.	360
Providing & casting in situ ordinary cement concrete M250 for RCC work	Cu.m.	450	Providing & casting in situ ordinary cement concrete M25 for RCC work	Cu.m.	380
Providing & casting in situ ordinary cement concrete M350 for RCC work	Cu.m.	500	Providing & casting in situ ordinary cement concrete M35 for RCC work	Cu.m.	425
Providing & casting in situ ordinary cement concrete M400 for RCC work	Cu.m.	525	Providing & casting in situ ordinary cement concrete M40 for RCC work	Cu.m.	440
Providing & casting in situ ordinary cement concrete M450 for RCC work	Cu.m.	540	Providing & casting in situ ordinary cement concrete M45 for RCC work	Cu.m.	450
New Item					
			Providing & casting in situ ordinary cement concrete M30 for RCC work	Cu.m.	410

The cement consumption of other than above concrete item and other details mentioned in circular vide No.SOR/1085/7/H(1) dated 08/12/1986 will be remain same.

(N.G.Parmar)

Officer on special Duty (S.P)

R&B Deparment

Gandhinagar

To, The Personal Secretary, Office Of The Secretary, Road & Building Department,
Sachivalaya, Gandhinagar

- (1) The Personal Secretary, Office Of The Secretary, Narmada, Water Resources,
Water Supply And Kalpsar Department, Sachivalaya, Gandhinagar
- (2) The Personal Secretary, Office Of The Principal Secretary, Health & Family
Welfare Department, Sachivalaya, Gandhinagar
- (3) The Personal Secretary, Office Of The Additional Chief Secretary, Urban
Development And Urban Housing Department, Sachivalaya, Gandhinagar
- (4) The Personal Secretary, Office Of The Principal Secretary, Panchayat, Rural
Housing And Rural Development Department, Sachivalaya, Gandhinagar
- (5) Accountant General, Rajkot/Ahmedabad
- (6) All The Chief Engineers, Road & Building Department, Sachivalaya, Gandhinagar
- (7) All The Chief Engineers, Road & Building Department, Sachivalaya,
Gandhinagar
- (8) The Managing Director, Gujarat State Road Development Corporation, Nirman
Bhavan, Gandhinagar
- (9) The Chief Engineer & Director, Staff Training Collage, Gandhinagar
- (10) The Director, Gujarat Engineering Research Institute (Geri), Vadodara
- (11) The Under Secretary, Gujarat Vigilance Commission, Vigilance Bhavan,
Gandhinagar
- (12) All The Superintending Engineers, Road Development (State Panchayat,
National Highway, Capital Project Circle, Electric Circle)
- (13) All The Executive Engineers, (As Above Circles)
- (14) All Technical Officers, Road & Building Department Sachivalaya, Gandhinagar
- (15) All Technical Branches, Road & Building Department, Sachivalaya
, Gandhinagar
- (16) President, Gujarat Contractors Association, Gajjara Hall, Law Garden, Law
Collage Road, Ahmedabad
- (17) Branch Select File-2017

**STANDARD FOR CEMENT
CONSUMPTION FOR DIFFERENT
ITEMS OF WORK**

Government of Gujarat
Roads & Building Department,
Circular No.PRC/10/2017/Cement Consumption/16/C
14,Sardar Bhavan,2nd Floor,
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Circular No. SOR/1085/7/H(1) dated 08/12/1986

CIRCULAR

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(N.G.Parmar)
Officer on Special Duty(S.P.)
R&B Department
Gandhinagar

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VOL 36 / Q1 / 2014

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ಪ್ರಕಟಣೆ: ೨೦೧೭-೧೮

મદતે છે. જમીં કાપવાનો કાર્યકર પણ બેનકાલે છે. મોજિદારીથી કાર્યવાહી કરે છે.

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

- $$= \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \right) = \frac{1}{2}$$

ଆମେ ଏହି ପଦ୍ଧତି ଆପଣଙ୍କ

Marking	73
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ଶ୍ରୀ-ସୁବ୍ରହ୍ମଣ୍ୟ-ନାମ ସ୍ତୋତ୍ର

સાધ્યપાલક ઈજનેર-ડી સહી :

પુલો તથા મકાનોના બાંધકામ કામનાં કામોમાં
પાઈલ ફાઉન્ડેશન માટે પાઈલ ઈન્ટીગ્રીટી
(Integrity) ટેસ્ટ કરવા બાબત

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ
બ્લોક નં. ૧૪/૨, સરદાર ભવન,
સચિવાલય, ગાંધીનગર
ક્રમાંક : એએસઆર/૧૦૨૦૧૮/૧૦૮/સી.
તા.૦૬/૦૪/૨૦૧૮

આમુખ:-

પુલો અને મકાનોના બાંધકામના કામોમાં પાયાની માટીનો પ્રકાર (Type of foundation soil) તથા ફાઉન્ડેશન ઉપર પડતા ભાર (Structural load) ને ધ્યાને લઈ બોર્ડ કાસ્ટ ઈન સીટુ (Bored cast insitu) પાઈલ ફાઉન્ડેશન કરવાની જરૂરીયાત રહે છે. બોર્ડ પાઈલ ફાઉન્ડેશનમાં કોંક્રિટની કામગીરી પુર્ણ થયા બાદ કરવામાં આવેલ પાઈલની લંબાઈ, પાઈલમાં પડેલ તીરાડ, પાઈલના કોસ સેક્શનની વિગતો, કોંક્રિટના સ્તરમાં બાજુમાંથી પડેલ માટી (Soil incursions) વિગેરેની વિગતો જાણ શકાતી ન હતી. પરંતુ હવે અસ્ટ્રાસોનીક ટેસ્ટીંગ પદ્ધતિથી પાઈલ ફાઉન્ડેશનની ગુણવત્તા, પાઈલની લંબાઈ વિગેરે જાણ શકાય તેમ છે. તે ધ્યાને લેતાં પુખ્ત વિચારણાને અંતે પરિપત્ર બહાર પાડવામાં આવે છે.

પરિપત્ર:-

માર્ગ અને મકાન વિભાગમાં જે કામોની મંજૂરી મળેલ હોય અને અંદાજ બનાવવાના બાકી હોય તેવા પાઈલ ફાઉન્ડેશનવાળા કામો માટે અંદાજમાં દરેક પાઈલ માટે પાઈલ ઈન્ટીગ્રીટી ટેસ્ટ (Pile Integrity Test) ની જોગવાઈ રાખવાની રહેશે. તદઉપરાંત હાલમાં જે કામો પ્રગતિમાં હોય, ટેન્ડર માંગવામાં આવેલ હોય અને આ કામોમાં પાઈલ ફાઉન્ડેશન પ્રકારનાં ફાઉન્ડેશન કરવાના હોય તેવા તમામ કામોમાં પણ દરેક પાઈલ માટે પાઈલ ઈન્ટીગ્રીટી ટેસ્ટ (Pile Integrity Test) કરાવી લેવાનો રહેશે.

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ઉપસચિવ (રા.ર.)
માર્ગ અને મકાન વિભાગ
ગાંધીનગર.

વર્ટીકલ વાયબ્રેટેડ પાર્થિપનો અંદાજમાં
સમાવેશ કરવા બાબત

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ
બ્લોક નં. ૧૪/૨, સરદાર ભવન,
સચિવાલય, ગાંધીનગર.
ક્રમાંક : એસઓઆર ૧૦૧૮ ૭૧૫ સી-૧.
તા. ૧૨/૦૭/૨૦૧૮

આમુખ:-

માર્ગ અને મકાન વિભાગમાં નવી ટેકનોલોજી તથા માલસામાનની ઉપયોગીતાને ધ્યાને લઈ વિભાગના કામોમાં નવી ટેકનોલોજી અને નવા માલસામાનનો ઉપયોગ કરવામાં આવે છે. સી.ડી. વર્કસ માટે એન.પી.-૩ અને એન.પી.-૪ પાર્થિપ માટે હોરીઝોન્ટલ સ્પન પાર્થિપ તથા વર્ટીકલી વાયબ્રેટેડ પાર્થિપ એમ બે પ્રકારના પાર્થિપ વપરાશમાં લેવામાં આવે છે. વર્ટીકલી વાયબ્રેટેડ પાર્થિપ માટે પાર્થિપનું ટકાઉ પશુ હોરીઝોન્ટલ સ્પન પાર્થિપ કરતા વધારે હોય છે. આ બાબત ધ્યાને લેતાં નીચે મુજબ પરિપત્ર કરવામાં આવે છે.

પરિપત્ર:-

જે રાજ્ય ધોરીમાર્ગો, મુખ્ય જિલ્લા માર્ગો અને અન્ય જિલ્લા માર્ગોને ચારમાર્ગીય કરવા ૧૦ મીટર પહોળો કરવા માટે મંજૂરી મળેલ હોય તેમજ રૂ. ૧૦ કરોડ અથવા તેથી વધારે રકમનાં રાજ્ય ધોરીમાર્ગો, મુખ્ય જિલ્લા માર્ગો અને અન્ય જિલ્લા માર્ગોનાં મંજૂર કામોમાં નવા પાર્થિપ કલવર્ટ બનાવવા માટે વર્ટીકલી વાયબ્રેટેડ એન.પી.-૩ એન.પી.-૪ પાર્થિપનો અંદાજમાં સમાવેશ કરવાનો રહેશે.

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ઉપસચિવ (રા.ર.)
માર્ગ અને મકાન વિભાગ
ગાંધીનગર.

પુલો તથા મકાનોના બાંધકામ કામનાં કામોમાં
પાઈલ ફાઉન્ડેશન માટે પાઈલ ઈન્ટીગ્રીટી
(Integrity) ટેસ્ટ કરવા બાબત

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ
બ્લોક નં. ૧૪/૨, સરદાર ભવન,
સચિવાલય, ગાંધીનગર
ક્રમાંક : એએસઆર/૧૦૨૦૧૮/૧૦૮/સી.
તા.૦૬/૦૪/૨૦૧૮

આમુખ:-

પુલો અને મકાનોના બાંધકામના કામોમાં પાયાની માટીનો પ્રકાર (Type of foundation soil) તથા ફાઉન્ડેશન ઉપર પડતા ભાર (Structural load) ને ધ્યાને લઈ બોર્ડ કાસ્ટ ઈન સીટુ (Bored cast insitu) પાઈલ ફાઉન્ડેશન કરવાની જરૂરીયાત રહે છે. બોર્ડ પાઈલ ફાઉન્ડેશનમાં કોંક્રિટની કામગીરી પુર્ણ થયા બાદ કરવામાં આવેલ પાઈલની લંબાઈ, પાઈલમાં પડેલ તીરાડ, પાઈલના કોસ સેક્શનની વિગતો, કોંક્રિટના સ્તરમાં બાજુમાંથી પડેલ માટી (Soil incursions) વિગેરેની વિગતો જાણ શકાતી ન હતી. પરંતુ હવે અસ્ટ્રાસોનીક ટેસ્ટીંગ પદ્ધતિથી પાઈલ ફાઉન્ડેશનની ગુણવત્તા, પાઈલની લંબાઈ વિગેરે જાણ શકાય તેમ છે. તે ધ્યાને લેતાં પુખ્ત વિચારણાને અંતે પરિપત્ર બહાર પાડવામાં આવે છે.

પરિપત્ર:-

માર્ગ અને મકાન વિભાગમાં જે કામોની મંજૂરી મળેલ હોય અને અંદાજ બનાવવાના બાકી હોય તેવા પાઈલ ફાઉન્ડેશનવાળા કામો માટે અંદાજમાં દરેક પાઈલ માટે પાઈલ ઈન્ટીગ્રીટી ટેસ્ટ (Pile Integrity Test) ની જોગવાઈ રાખવાની રહેશે. તદઉપરાંત હાલમાં જે કામો પ્રગતિમાં હોય, ટેન્ડર માંગવામાં આવેલ હોય અને આ કામોમાં પાઈલ ફાઉન્ડેશન પ્રકારનાં ફાઉન્ડેશન કરવાના હોય તેવા તમામ કામોમાં પણ દરેક પાઈલ માટે પાઈલ ઈન્ટીગ્રીટી ટેસ્ટ (Pile Integrity Test) કરાવી લેવાનો રહેશે.

(એ.એન.મિસ્ત્રી)
ઉપસચિવ (રા.ર.)
માર્ગ અને મકાન વિભાગ
ગાંધીનગર.

વર્ટીકલ વાયબ્રેટેડ પાઈપનો અંદાજમાં
સમાવેશ કરવા બાબત

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ
બ્લોક નં. ૧૪/૨, સરદાર ભવન,
સચિવાલય, ગાંધીનગર
ક્રમાંક : એસઓઆર ૧૦૧૮ ૭૧૫ સી-૧.
તા. ૧૨/૦૭/૨૦૧૮

આમુખ:-

માર્ગ અને મકાન વિભાગમાં નવી ટેકનોલોજી તથા માલસામાનની ઉપયોગીતાને ધ્યાને લઈ વિભાગના કામોમાં નવી ટેકનોલોજી અને નવા માલસામાનનો ઉપયોગ કરવામાં આવે છે. સી.ડી. વર્કસ માટે એન.પી.-૩ અને એન.પી.-૪ પાઈપ માટે હોરીઝોન્ટલ સ્પન પાઈપ તથા વર્ટીકલી વાયબ્રેટેડ પાઈપ એમ બે પ્રકારના પાઈપ વપરાશમાં લેવામાં આવે છે. વર્ટીકલી વાયબ્રેટેડ પાઈપ માટે પાઈપનું ટકાઉ પશ્ચુ હોરીઝોન્ટલ સ્પન પાઈપ કરતા વધારે હોય છે. આ બાબત ધ્યાને લેતાં નીચે મુજબ પરિપત્ર કરવામાં આવે છે.

પરિપત્ર:-

જે રાજ્ય ધોરીમાર્ગો, મુખ્ય જિલ્લા માર્ગો અને અન્ય જિલ્લા માર્ગોને ચારમાર્ગીય કરવા ૧૦ મીટર પહોળો કરવા માટે મંજૂરી મળેલ હોય તેમજ રૂ. ૧૦ કરોડ અથવા તેથી વધારે રકમનાં રાજ્ય ધોરીમાર્ગો, મુખ્ય જિલ્લા માર્ગો અને અન્ય જિલ્લા માર્ગોનાં મંજૂર કામોમાં નવા પાઈપ કલવર્ટ બનાવવા માટે વર્ટીકલી વાયબ્રેટેડ એન.પી.-૩ એન.પી.-૪ પાઈપનો અંદાજમાં સમાવેશ કરવાનો રહેશે.

(એ.એન.મિસ્ત્રી)
ઉપસચિવ (રા.ર.)
માર્ગ અને મકાન વિભાગ
ગાંધીનગર.

પુલો તથા મકાનોના બાંધકામ કામનાં કામોમાં
પાઈલ ફાઉન્ડેશન માટે પાઈલ ઈન્ટીગ્રીટી
(Integrity) ટેસ્ટ કરવા બાબત

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ
બ્લોક નં. ૧૪/૨, સરદાર ભવન,
સચિવાલય, ગાંધીનગર
ક્રમાંક : એએસઆર/૧૦૨૦૧૮/૧૦૮/સી.
તા.૦૬/૦૪/૨૦૧૮

આમુખ:-

પુલો અને મકાનોના બાંધકામના કામોમાં પાયાની માટીનો પ્રકાર (Type of foundation soil) તથા ફાઉન્ડેશન ઉપર પડતા ભાર (Structural load) ને ધ્યાને લઈ બોર્ડ કાસ્ટ ઈન સીટુ (Bored cast insitu) પાઈલ ફાઉન્ડેશન કરવાની જરૂરીયાત રહે છે. બોર્ડ પાઈલ ફાઉન્ડેશનમાં કોફ્રિટની કામગીરી પૂર્ણ થયા બાદ કરવામાં આવેલ પાઈલની લંબાઈ, પાઈલમાં પડેલ તીરાડ, પાઈલના ક્રોસ સેક્શનની વિગતો, કોફ્રિટના સ્તરમાં બાજુમાંથી પડેલ માટી (Soil incursions) વિગેરેની વિગતો જાણ શકાતી ન હતી. પરંતુ હવે અસ્ટ્રાસોનીક ટેસ્ટીંગ પદ્ધતિથી પાઈલ ફાઉન્ડેશનની ગુણવત્તા, પાઈલની લંબાઈ વિગેરે જાણ શકાય તેમ છે. તે ધ્યાને લેતાં પુખ્ત વિચારણાને અંતે પરિપત્ર બહાર પાડવામાં આવે છે.

પરિપત્ર:-

માર્ગ અને મકાન વિભાગમાં જે કામોની મંજૂરી મળેલ હોય અને અંદાજ બનાવવાના બાકી હોય તેવા પાઈલ ફાઉન્ડેશનવાળા કામો માટે અંદાજમાં દરેક પાઈલ માટે પાઈલ ઈન્ટીગ્રીટી ટેસ્ટ (Pile Integrity Test) ની જોગવાઈ રાખવાની રહેશે. તદઉપરાંત હાલમાં જે કામો પ્રગતિમાં હોય, ટેન્ડર માંગવામાં આવેલ હોય અને આ કામોમાં પાઈલ ફાઉન્ડેશન પ્રકારનાં ફાઉન્ડેશન કરવાના હોય તેવા તમામ કામોમાં પણ દરેક પાઈલ માટે પાઈલ ઈન્ટીગ્રીટી ટેસ્ટ (Pile Integrity Test) કરાવી લેવાનો રહેશે.

(એ.એન.મિસ્ત્રી)
ઉપસચિવ (સા.ર.)
માર્ગ અને મકાન વિભાગ
ગાંધીનગર.

વર્ટીકલ વાયબ્રેટેડ પાઈપનો અંદાજમાં
સમાવેશ કરવા બાબત

ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ
બ્લોક નં. ૧૪/૨, સરદાર ભવન,
સચિવાલય, ગાંધીનગર
ક્રમાંક : એસઓઆર ૧૦૧૮ ૭૧૫ સી-૧.
તા. ૧૨/૦૭/૨૦૧૮

આમુખ:-

માર્ગ અને મકાન વિભાગમાં નવી ટેકનોલોજી તથા માલસામાનની ઉપયોગીતાને ધ્યાને લઈ વિભાગના કામોમાં નવી ટેકનોલોજી અને નવા માલસામાનનો ઉપયોગ કરવામાં આવે છે. સી.ડી. વર્કસ માટે એન.પી.-૩ અને એન.પી.-૪ પાઈપ માટે હોરીઝોન્ટલ સ્પન પાઈપ તથા વર્ટીકલી વાયબ્રેટેડ પાઈપ એમ બે પ્રકારના પાઈપ વપરાશમાં લેવામાં આવે છે. વર્ટીકલી વાયબ્રેટેડ પાઈપ માટે પાઈપનું ટકાઉ પજી હોરીઝોન્ટલ સ્પન પાઈપ કરતા વધારે હોય છે. આ બાબત ધ્યાને લેતાં નીચે મુજબ પરિપત્ર કરવામાં આવે છે.

પરિપત્ર:-

જે રાજ્ય ધોરીમાર્ગો, મુખ્ય જિલ્લા માર્ગો અને અન્ય જિલ્લા માર્ગોને ચારમાર્ગીય કરવા ૧૦ મીટર પહોળો કરવા માટે મંજૂરી મળેલ હોય તેમજ રૂ. ૧૦ કરોડ અથવા તેથી વધારે રકમનાં રાજ્ય ધોરીમાર્ગો, મુખ્ય જિલ્લા માર્ગો અને અન્ય જિલ્લા માર્ગોનાં મંજૂર કામોમાં નવા પાઈપ કલવર્ટ બનાવવા માટે વર્ટીકલી વાયબ્રેટેડ એન.પી.-૩ એન.પી.-૪ પાઈપનો અંદાજમાં સમાવેશ કરવાનો રહેશે.

(એ.એન.મિસ્ત્રી)
ઉપસચિવ (રા.ર.)
માર્ગ અને મકાન વિભાગ
ગાંધીનગર.

- ૩૧ -

ગુજરાત સરકાર
માર્ગ અને યાતાન વિભાગ
પરિપત્ર ક્રમાંક ટીબીએસી-૧૦-૨૦૧૫-૧૧-સી
સચિવાલય, ગાંધીનગર
તા.૧૭/૧૦/૨૦૧૫

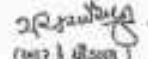
વિષય: મૂળ ઇજારદારશ્રી ક્રમ કરવા માટે અસફા રહે તો તેમની સમિ તા.સમિતિ પગલા લેવા સંબંધી કરવા બહાલ



- (૧) મા.મ. વિભાગનો પરિપત્ર ક્રમાંક ટીબીએસી-૧૬૭૯-આઇબી-૫૬૭-(૪૨)-સી તા.૨૭/૦૬/૧૯૮૦
(૨) મા.મ. વિભાગનો પરિપત્ર ક્રમાંક ટીબીએસી-૧૬૭૯-આઇબી-૫૬૭-(૪૨)-સી તા.૧૬/૧૨/૧૯૮૦
(૩) મા.મ. વિભાગનો પરિપત્ર ક્રમાંક ટીબીએસી-૧૫૮૫-આઇબી-૨૦૧-(૬૩)-સી તા.૧૨/૦૮/૧૯૮૫ (અંગ્રેજીમાં)
(૪) મા.મ. વિભાગનો પરિપત્ર ક્રમાંક ટીબીએસી-૧૫૮૫-આઇબી-૨૦૧-(૬૩)-સી તા.૧૨/૦૮/૧૯૮૫ (ગુજરાતીમાં)
(૫) મા.મ. વિભાગનો પરિપત્ર ક્રમાંક પીટીડીબી-૫૦૮૨-૪૬૩-૨-સ તા.૧૨/૦૩/૧૯૯૦

પરિપત્ર

મા.મ. વિભાગ બસ માર્ગ ટેન્ડરની શરતો પાઠવી નહી કરેલ સમયામાં ક્રમ પૂર્ણ કરવા માટે જમારે મૂળ ઇજારદાર નિષ્ક્રમ થાય અથવા તો ક્રમ અપૂર્ણ હોયને શરતો જાણ ત્યારે તે અપૂર્ણ ક્રમ બીજા ઇજારદારશ્રી બસ મૂળ ઇજારદારના અર્થે અને જોખમે પૂરું કરાવવા અને મૂળ ઇજારદાર પાસેથી વધારાના ભાવે માટેની રકમની વસુલાત કરવા સંબંધી કાર્યવાહી કરવામાં આવતી હતી. પરંતુ આ પ્રકારની વસુલાત મૂળ ઇજારદાર પાસેથી કરવા પછી વાર સેટમાં પણ જનું પડતું હતું અને આવી રકમ વસુલાત કરવામાં પછી વિવાદ થતો હતો. પરંતુ હવે ટેન્ડરમાં મૂળ ઇજારદારશ્રીએ અપૂર્ણ હોયના કારણે બીજા ઇજારદારશ્રી બસ મૂળ ઇજારદારના અર્થે અને જોખમે પૂરું કરાવવા અને મૂળ ઇજારદાર પાસેથી વધારાના ભાવે માટેની રકમની વસુલાત કરવા સંબંધી જોગવાઈ રદ કરવામાં આવેલ છે. આથી હવે ઉપરોક્ત પરિપત્રોમાંની સુધનાઓની અમલવારી હવે કરવાની રહેતી નથી અને આ પરિપત્રોની સુધનાઓને રદ ગણવાની રહેશે.


(આર.કે.વી.સેલા)

માસ કરજ પરના અધિકારીશ્રી (સી.એ.)
માર્ગ અને યાતાન વિભાગ
ગાંધીનગર

પત્રિ,

સર્વે અધિકાર ઇજારદારશ્રીએ, મા.મ. વર્તુળ/પંચાયત મા.મ. ગાંધી/ને.સ. વર્તુળ/સિડસપેસ યે વર્તુળ/ પા.વો. વર્તુળ સહિત

મુદ્દે ક્રમાંક ૧૦૭૩ ઇજારદારશ્રીએ ઉપરોક્ત દુનુલી ટેન્ડરના સર્વે વિભાગે

સર્વે તાત્કાલિક અધિકારીશ્રીએ, મા.મ.સ.સી.સી. સહિત, મા.મ. વિભાગ, સચિવાલય, ગાંધીનગર

સર્વે મા.મ.સ.સી.સી. સહિત, ગાંધીનગર

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
અધિકારી ઇજારદારની સહી :

રસ્તા, પુલો અને મકાનોની ગુણવત્તા ચકાસણી માટેના
નિયતપત્રકોનો ઉપયોગ ઈન્સ્પેક્શન નોંધ માટે કરવા બાબત
ગુજરાત સરકાર
માર્ગ અને મકાન વિભાગ
બ્લોક નં. ૧૪/૨, સરદાર ભવન,
સચિવાલય, ગાંધીનગર
ક્રમાંક : PRC-10-2017-31-C
તા.૨૬/૦૫/૨૦૧૭

પરિપત્ર

માર્ગ અને મકાન વિભાગના રસ્તા, પુલ અને મકાનના કામો ઈજારદારશ્રી મારફત કરાવવામાં આવે છે. આ કામોની ગુણવત્તા ચકાસણી કરવાનું કામ ગુણવત્તા નિયમન (મા.મ.) વિભાગ દ્વારા કરવામાં આવે છે. કામોની ચકાસણી માટે ગુણવત્તા નિયમન (મા.મ.) વિભાગ હેઠળ ગુજરાત રાજ્યમાં કુલ-૬ (છ) કાર્યપાલક ઈજનેરશ્રીઓની નિમણૂક કરવામાં આવેલ છે. કામોની ગુણવત્તા ચકાસણી કરી તેનો સ્થળ સ્થિતિ મુજબનો ઈન્સ્પેક્શન રીપોર્ટ કાર્યપાલક ઈજનેરશ્રી દ્વારા તૈયાર કરી જે તે સંબંધિત કાર્યપાલક ઈજનેરશ્રીને પુર્તતા અર્થે સાદર કરવામાં આવે છે અને એની જાણ જે તે વિભાગના કાર્યપાલક ઈજનેરશ્રીઓ દ્વારા રજૂ કરવામાં આવતા ઈન્સ્પેક્શન રીપોર્ટની વિગતોમાં એકસરખા ફોર્મેટ વિભાગ દ્વારા નિયત કરેલ ન હોવાથી એકસૂત્રતા રહેતી નથી.

મુખ્ય ઈજનેરશ્રીઓની કમિટીમાં નકકી થયા મુજબ ઈન્સ્પેક્શન રીપોર્ટમાં એકસૂત્રતા રહે અને પી.એમ.જી.એસ.વાય.માં "ગ્રેડ સિસ્ટમ" વાળો રીપોર્ટ સાદર કરવામાં આવે છે એ પદ્ધતિએ ઈન્સ્પેક્શન રીપોર્ટનું ફોર્મેટ બનાવવા જણાવવામાં આવેલ હતું. માર્ગ અને મકાન વિભાગના રસ્તા, પુલ અને મકાન માટેના ગુણવત્તા ચકાસણી કરવા માટેના ઈન્સ્પેક્શન રીપોર્ટના ફોર્મેટ ગ્રેડ સિસ્ટમવાળા આ સાથે તૈયાર કરવામાં આવેલ છે. હવે પછી ગુણવત્તા વિભાગના મુખ્ય ઈજનેરશ્રી, અધિક્ષક ઈજનેરશ્રી, કાર્યપાલક ઈજનેરશ્રી, સંબંધિત અધિક્ષક ઈજનેરશ્રી તથા જે કોઈ પણ અધિકારીશ્રી ગુણવત્તા ચકાસણીની કામગીરી કરે તેમણે આ ફોર્મેટનો ઈન્સ્પેક્શન રીપોર્ટ માટે ઉપયોગ કરવાનો રહેશે.

કામની ચકાસણી કર્યા બાદ કામનો એકંદરે ગ્રેડ "S (Satisfactory), SRI (Satisfactory but require improvement) કે U (Unsatisfactory)" આપવાનો રહેશે.

- (૧) જો ગુણવત્તા ચકાસણીમાં કામનો એકંદરે ગ્રેડ "S" મળશે તો એ કામ Satisfactory કક્ષાનું હોય કોઈ પુર્તતા કરવાની રહેતી નથી.
- (૨) જો ગુણવત્તા ચકાસણીમાં કામનો એકંદરે ગ્રેડ "SRI" (Satisfactory but require improvement) મળશે તો જે તે આઈટમમાં "SRI/U" ગ્રેડ મળેલ છે એ આઈટમની સુધારણા ટેન્ડરમાં જણાવેલ સ્પેશીફિકેશન મુજબ કરી એનો "ATR" (Action Taken Report) સંબંધિત કાર્યપાલક ઈજનેરશ્રીએ તૈયાર કરી જે તે ગુણવત્તા નિયમન વિભાગના કાર્યપાલક ઈજનેરશ્રીની ફરીથી સ્થળ મુલાકાત કરાવશે અને ગુણવત્તા નિયમન વિભાગના કાર્યપાલક ઈજનેરશ્રી પૂર્તતા સાથે સહમત હોય તો અહેવાલ અધિક્ષક ઈજનેરશ્રી, ગુણવત્તા નિયમન વિભાગને સાદર કરશે. અધિક્ષક ઈજનેરશ્રી, ગુણવત્તા નિયમન વિભાગ પુર્તતા અહેવાલ યોગ્ય હશે તો રીગ્રેડ એટલે "SRI/U" માંથી "S" માટે ભલામણ કરશે. ત્યારબાદ સદરહુ પુર્તતા અહેવાલ સંબંધિત અધિક્ષક ઈજનેરશ્રી મારફત સંબંધિત મુખ્ય ઈજનેરશ્રીને સાદર કરવાનો રહેશે. સંબંધિત મુખ્ય ઈજનેરશ્રીએ સદરહુ "ATR" મુખ્ય ઈજનેરશ્રી ગુણવત્તા નિયમન વિભાગને પુર્તતા ગ્રાહ્ય રાખી "S" ગ્રેડીંગ આપવા માટે ભલામણ સહ સાદર કરવાનો રહેશે. ગુણવત્તા નિયમન વિભાગમાંથી પુર્તતા ગ્રાહ્ય રાખી "S" ગ્રેડીંગનું પ્રમાણપત્ર મળ્યા બાદ જ આ આઈટમનું બાકીનું ચક્રવર્ણ કરવાનું રહેશે.
- (૩) ગુણવત્તા ચકાસણીમાં કામનો એકંદરે ગ્રેડ "U" (unsatisfactory) મળશે તો જે તે આઈટમમાં "SRI/U" મળેલ છે એ આઈટમમાં સુધારણા અથવા Reconstruction (આઈટમ ફરીથી કરવી) ટેન્ડરમાં જણાવેલ સ્પેશીફિકેશન મુજબ ફરી એનો "ATR" સંબંધિત કાર્યપાલક ઈજનેરશ્રીએ તૈયાર કરી જે તે ગુણવત્તા નિયમન વિભાગના કાર્યપાલક ઈજનેરશ્રીની ફરીથી સ્થળ મુલાકાત કરાવશે અને ગુણવત્તા નિયમન વિભાગના કાર્યપાલક ઈજનેરશ્રી પુર્તતા સાથે સહમત હોય તો અહેવાલ અધિક્ષક ઈજનેરશ્રી, ગુણવત્તા નિયમન વિભાગને સાદર કરશે. અધિક્ષક ઈજનેરશ્રી, ગુણવત્તા નિયમન વિભાગ પુર્તતા અહેવાલ યોગ્ય હશે તો રીગ્રેડ એટલે "SRI/U" માંથી "S" માટે ભલામણ કરશે. ત્યારબાદ સદરહુ પુર્તતા અહેવાલ સંબંધિત અધિક્ષક ઈજનેરશ્રી મારફત સંબંધિત મુખ્ય ઈજનેરશ્રીને સાદર કરવાનો રહેશે. સંબંધિત મુખ્ય ઈજનેરશ્રીએ સદરહુ "ATR" મુખ્ય ઈજનેરશ્રી ગુણવત્તા નિયમન વિભાગને પુર્તતા ગ્રાહ્ય રાખી "S" ગ્રેડીંગ આપવા માટે ભલામણસહ સાદર કરવાનો રહેશે. ગુણવત્તા નિયમન વિભાગમાંથી પુર્તતા ગ્રાહ્ય રાખી "S" ગ્રેડીંગનું પ્રમાણપત્ર મળ્યા બાદ જ સમગ્ર કામનું બાકીનું ચક્રવર્ણ કરવાનું રહેશે.
ઉપરોક્ત સુચનાનો અમલ ચુસ્તપણે તાત્કાલિક અસરથી કરવાનો રહેશે.

બિડાણ :-

- (૧) રસ્તા, પુલ અને મકાનના કામોની
ગુણવત્તા ચકાસણી માટેના નિયત પત્રકો
- (૨) એ.ટી.આર.નું નિયત પત્રક

(એન.જી.પરમાર)
ખાસ ફરજ પરના અધિકારી
(વિ.યો.)
માર્ગ અને મકાન વિભાગ
ગાંધીનગર.

ANNEXURE - 'A'
TECHNICAL REQUIREMENT OF DRUM MIX PLANT

COMPOSITION OF PLANT :-

The Drum mix plant shall conform generally to I.S. Specifications No. IS : 3066 / 1965 as amended from time to time and shall be equipped with the following arrangements.

1. COLD AGGREGATE FEEDER :

The cold aggregate feeder shall have minimum three independent bins or compartment, each provided with accurate mechanical pre-determined rate to cold convator or to some intermediate conveyor or directly into the dryer. The feeder shall provide for the adjustment of total and proportional feed and shall be capable of being locked in any setting.

2. DRYER

The dryer shall be capable of continuously agitating the aggregates while heating to the desired temperature. At the discharge end of the dryer or any other suitable location means shall be provided for ascertaining the temperature of the heated aggregate.

3. SCREENING UNIT AND GRADATION CONTROL

The dried aggregate shall be screened into not less than three sizes, the plant shall include means for accurately proportioning, each size of aggregate either by weight volumetric measurement. The gradation control is by volume, the unit shall include feeder mounted under the compartment bins, each bin shall have an accurately controlled, individual gate to form an office for proportioning the material drawn from wach respective bin compartment. The office shall have positive mechanical adjustment and provided with a lock. Indicators shall be provided on each gate to show the opening in centimeters.

Signature of the Contractor :
ନି-ସ୍ୱାକ୍ଷରୀତ ହେଉ :

Signature of the Executive Engineer
ସ୍ୱାକ୍ଷରୀତ ହେଉ :

4. MIXER UNIT

The plant shall include a mixer of an approved twinshaft pugmill type capable of producing a uniform mix. If not enclosed, the mixer box shall be equipped with a dust hood to prevent loss of fines.

5. MINERAL FILLER SUPPLY UNIT

There shall be an independent arrangement to feed mineral filler directly into the pugmill. The hopper to bin for mineral filler shall provide for adjustment proportion the feed with the aggregate and binders and shall be capable of being located in any setting.

6. BITUMEN HEATING :

A heating system for bitumen always with effective and positive control of temperature shall be provided to maintain proper temperature and for allowing continuous during the entire operating period. Suitable arrangement shall be provided for recording the temperature at the tanks and in the circulating system

7. SYNCHRONIZATION

For synchronization of aggregate bitumen and filler feeds satisfactory means shall be provided the effort positive inter-locking control between the flow of aggregate from the bins or compartment flow bitumen from the tank and flow of mineral filler.

Signature of Contractor

Executive Engineer

Signature of the Contractor :
ਸੰਤੁਲਨ-ਫੀ ਅਫੀ :

Signature of the Executive Engineer
ਸੰਤੁਲਨ ਫੀ ਅਫੀ :

ANNEXURE - 'B'

ADDITIONAL REQUIREMENT FOR THE DRUM MIX PLANT AND PAVER
FINISHER AS PER M.O.S.T. SPECIFICATION.

(IInd REVISION - FEBRUARY - 1988)

- (a) Cold aggregate feed system for providing blended aggregate in the correct proportion (called cold binfeed arrangement)
- (b) Rotating cylindrical dryer drum fitted with suitable burner capable of heating the aggregate to the required temperature without any visible unburnt fuel or carbon residue on the aggregate and to reduce the moisture content of the aggregate to the specified minimum level.
- (c) The dryer units shall be fitted with approved type of thermometric instruments at appropriate places so as to indicate or automatically record / register the temperature of heated aggregate before adding / mixing the binder

(d) GRADATION CONTROL

Except in case of drum mix plant, other two types of plants mentioned above shall have :

- i) A screen unit for accurate sizing of hot aggregate and feeding the same to mixing unit by weight or volume control as per the specified job mix formula
 - ii) Paddle mixer unit shall be capable of producing a homogenous mix with uniform coating of all particles of the mineral aggregate with binder.
- (e) In case of drum mix plant, the cold feed system shall have variable speed belt conveyors / or other suitable devices for regulating the accurate into an even feed flow automatically from a central operating control cabin

Signature of the Contractor :
ସ୍ୱାକ୍ଷରଣ କରିବାକୁ ସ୍ଥାନ :

Signature of the Executive Engineer
ଅଧ୍ୟକ୍ଷକ ଇଞ୍ଜିନିୟରଙ୍କ ଦ୍ୱାରା ସ୍ୱାକ୍ଷରଣ କରିବାକୁ ସ୍ଥାନ :

4. MIXER UNIT

The plant shall include a mixer of an approved twinshaft pugmill type capable of producing a uniform mix. If not enclosed, the mixer box shall be equipped with a dust hood to prevent loss of fines.

5. MINERAL FILLER SUPPLY UNIT

There shall be an independent arrangement to feed mineral filler directly into the pugmill. The hopper to bin for mineral filler shall provide for adjustment proportion the feed with the aggregate and binders and shall be capable of being located in any setting.

6. BITUMEN HEATING :

A heating system for bitumen always with effective and positive control of temperature shall be provided to maintain proper temperature and for allowing continuous during the entire operating period. Suitable arrangement shall be provided for recording the temperature at the tanks and in the circulating system.

7. SYNCHRONIZATION

For synchronization of aggregate bitumen and filler feeds satisfactory means shall be provided the effort positive inter-locking control between the flow of aggregate from the bins or compartment flow bitumen from the tank and flow of mineral filler.

Signature of Contractor

Executive Engineer

Signature of the Contractor :
ਸਿ-ਸ਼ਿਸ਼ਤੀ-ਨੀ ਅਧੀ :

Signature of the Executive Engineer
ਸਿ-ਸ਼ਿਸ਼ਤੀ-ਨੀ ਅਧੀ :

ANNEXURE - 'B'

ADDITIONAL REQUIREMENT FOR THE DRUM MIX PLANT AND PAVER
FINISHER AS PER M.O.S.T. SPECIFICATION.

(IInd REVISION - FEBRUARY - 1988)

- (a) Cold aggregate feed system for providing blended aggregate in the correct proportion (called cold binfeed arrangement)
- (b) Rotating cylindrical dryer drum fitted with suitable burner capable of heating the aggregate to the required temperature without any visible unburnt fuel or carbon residue on the aggregate and to reduce the moisture content of the aggregate to the specified minimum level.
- (c) The dryer units shall be fitted with approved type of thermometric instruments at appropriate places so as to indicate or automatically record / register the temperature of heated aggregate before adding / mixing the binder

(d) GRADATION CONTROL

Except in case of drum mix plant, other two types of plants mentioned above shall have :

- i) A screen unit for accurate sizing of hot aggregate and feeding the same to mixing unit by weight or volume control as per the specified job mix formula
 - ii) Paddle mixer unit shall be capable of producing a homogenous mix with uniform coating of all particles of the mineral aggregate with binder.
- (e) In case of drum mix plant, the cold feed system shall have variable speed belt conveyors / or other suitable devices for regulating the accurate into an even feed flow automatically from a central operating control cabin

Signature of the Contractor :
ਸਿੰਘਸਤੀ-ਭਿ ਅਫ਼ੀ :

Signature of the Executive Engineer
ਸਿੰਘਸਤੀ-ਭਿ ਅਫ਼ੀ :

BITUMEN CONTROL UNIT

Capable of measuring / metering and spraying required quantity of bitumen at specified temperature with automatic synchronisation of bitumen and aggregate feed.

FILLER SYSTEM

Fines feeder system suitable to receive bagged or bulk supply of filler material and its incorporation to the mix in the correct quantity shall be a necessary auxiliary.

DUST CONTROL :

A suitable built in dust control equipment for the dryer to contain the exhaust of fine dust into atmosphere for environmental control, wherever so specified by the Engineer.

Suitable auxiliary bitumen boiler of adequate capacity with self heating arrangement and temperature control device. The boiler shall be fitted with temperature indicating instruments.

REQUIREMENT FOR ESSENTIAL FEATURES FOR PAVER FINISHER

- (a) Loading hoppers and suitable distributing mechanism.
- (b) All drives having hydrostatic drive/ control.
- (c) The machine shall have a hydraulically extendable screed for appropriate width requirement.
- (d) The screed shall have temping and vibrating arrangement for initial compaction to the layer as it is spread without rutting or otherwise marring the surface. It shall have adjustable amplitude and infinitely variable frequency.
- (e) The paver shall be equipped with necessary control mechanism so as to ensure that the finished surface is free from surface blemishes.
- (f) The screed shall have internal heating arrangement 20mm thick M.S.S. can be laid by means of self propelled mechanical paver with suitable screeds capable of spreading temping and finishing the mix true to the specified lines grades and cross section.

Signature of Contractor

Executive Engineer

Signature of the Contractor :
ଅନୁମୋଦିତ ନାହିଁ :

Signature of the Executive Engineer
ଅନୁମୋଦିତ ନାହିଁ :

ANNEXURE - "C"

SPECIAL CONDITION FOR BITUMINOUS SURFACE WORK WITH USE OF DRUM MIX PLANT AND PAVER FINISHER.

- [1] The Drum mix plant and accessories to be used for the work shall be conformity with the specifications prescribed vide Govt. of India Ministry of Transport Circular No. RW/RMP/1613784 Dtd. 01-01-87. The plant shall be equipped with all units and accessories as per latest I.S. 3066/1965 as amended from time to time. The contractors will have to modify their plants suitable with in a period of six months from the date of issue of latest I.S. specification or codes (as per applicable on the last date of issue of the tenders)
- [2] The work of laying agreement asphalt hot mixed with bitumen shall start on site of work only after 8.00 hours. in the morning and continue upto 17.00 hours in winter season and upto 18.330 hours is summer. No work shall be done except during the period mentioned above and also on Sundays and national holidays viz. 26th January, 15th August and 2nd October.
- [3] Quantity of bituminous aggregate mix to be laid shall be restricted to 250 tonne per day for 30/40 capacity plant and may be or less depending upon the rated capacity of the plant.
- [4] The work of laying asphalt mix shall start latest within 60 days from the date of issue of work order and will be completed as per time limit. Reasons for delay in starting of work after 60 days shall result into sufficient cause for levying composition for disproportionate progress. However, the period for 15th June to 15th October being monsoon shall not be counted for the purpose of disproportionate progress and consequent cause for levy of compensation. The contractors shall commence the work of laying pavement on or before the last date of period mentioned above failing which he shall pay compensation not less than Rs. 500/- per day for every day that he shall delay the commencement of the work as above in accordance with Clause - 2 of the contract.
- [5] Further if after commencement of work within 60 days of issue of work-order and after doing some work, the contractor leaves the work in complete except for the following reasons compensation at the Rate of Rs. 500.00 per day will be levied from the date of stoppage of asphalt work to date of its resumption.
 - [1] For the days the stoppage is solvely due to break down of machinery and
 - [2] Paver plant is not shifted from the site and no work is done on other site through the paver plant during the period of break down of machinery.

Signature of the Contractor :
Նիգիսէր-Ու ՆԱՌ :

Signature of the Executive Engineer
ՆԱՎԱԳԵՆ ՆԻԴԻՐ-Ու ՆԱՌ :

- [6] However if contractor completes the work within stipulated time as per tender agreement. Government may consider to relax this provision and refund the amount recovered after completion of the work.

The contractor shall invariably get the job mix formula for the mix approved by the Engineer-in-Charge before starting the work.

Signature of Contractor

Executive Engineer

Signature of the Contractor :
ਡਿ-ਸਿਗਨੇਚਰ-ਓਫ਼ ਕਨਟਰਾਕਟਰ :

Signature of the Executive Engineer
ਡਿ-ਸਿਗਨੇਚਰ-ਓਫ਼ ਏਗਜ਼ੀਕਿਊਟਿਵ ਐਂਜੀਨੀਅਰ :

ANNEXURE – D

(AS PER GOVT. IN R & B DEPARTMENT CIRCULAR NO.
SNR/1099/IB/91(9)/5 DT. 26-07-1999.)

The contractor shall have to provide a permanent structure laboratory at plant site of at least 25.00 Sqm. Area with provision of water and light facilities.

The contractor shall have to provide following asphalt testing instruments in the laboratory.

[1]	Penetration Test	I.S. 1203
[2]	Softening point Test	I.S. 1205
[3]	Ductility Test	I.S. 1208
[4]	Viscosity Test	I.S. 1206
[5]	Specific gravity Test	I.S. 1202

The above instrument shall be as per I.S. and they shall be calibrated regularly and in working condition.

Note :-

1. Annexure- A-B-C & D attached shall be applicable for drum mix plant paver & its condition.
2. The asphalt shall be brought by the agency at his own cost and shall have to transport the bulk asphalt at plant site & work site at his own cost and shall have to make satisfactory arrangement at his own cost as directed by the engineer in charge.
3. The bitumen shall be of 80/100 grade satisfying the requirement of I.S. 73.
4. The material (Metal murrum) supplied on site by the agency shall be cross checked by another Deputy Engineer as per rules before spreading the collected materials.

Signature of Contractor

Executive Engineer

Signature of the Contractor :
ଶି-୧୧୨୨-୩ ଓଡ଼ି :

Signature of the Executive Engineer
ଶି-୧୧୨୨-୩ ଓଡ଼ି :

(ગુજરાત સરકારશ્રીના માર્ગ અને મકાન વિભાગના પરિપત્ર ક્રમાંક : આરજીએન : ૬૦૨૦૦૬ (૩૫) સ.
તા. ૩૧-૦૫-૨૦૦૭)

:: કરારની ખાસ શરતો ::

કામરની કામની ચકાસણી માટે કોરકટીંગ મશીન વસાવવા તથા રૂા. ૧૦૦.૦૦ લાખથી ઉપરના કામ માટે
ઈજારદારશ્રી દ્વારા ફુલટાઈમ કવોલીફાઈડ ઈજનેર રાખવા અંગે નીચેની શરતો ફાળલ કરેલ છે.

શરતો :-

- (૧) "૫૦ મીમી થી વધુ કામર કામની સંયુક્ત જાડાઈ (બી.એસ.જી., બી.બી.એમ સિવાય) હોય તેવા રસ્તાના
કામમાં દર ૨૫૦ મીટર દીઠ એક કોસ સેકશન પર કામર કામની પહોળાઈ અનુસાર બે થી ચાર કોર
સેમ્પલ ઈજારદાર પોતાના કોર કટીંગ મશીન વડે સંબંધિત નાયબ કાર્યપાલક ઈજનેરની હાજરીમાં મેળવી
આપવાના રહેશે અને આ સેમ્પલ સીલ કરી માન્ય લેબોરેટરી મારફત થીક્રોમ, કેન્સીટી તથા બીટ્યુમીનસ
કન્ટેન્ટના પરિણામ કરાવી પરિણામો મેળવવાના રહેશે. સંતોષકારક પરિણામો આવ્યા મુધી કામર કામની
ચુકવવાપાત્ર રકમના ૫% રકમ વીથહેલ્ડ રાખવામાં આવશે. જે રકમ સંતોષકારક પરિણામો મળ્યા બાદ જ
છુટી કરાશે. પરંતુ સંતોષકારક પરિણામ નહિ મેળવવાના કિસ્સાઓમાં કરારની અન્ય શરતો અનુસાર
કાર્યવાહી થઈ શકશે"
- (૨) " કરાર હેઠળના કામ પર ઈજારદારે ફુલટાઈમ કવોલીફાઈડ એન્જનીયર નિયુક્ત કરવાનો રહેશે. જે અંગે
કામનો વર્કઓર્ડર મળ્યે દિન-૧૫ માં કાર્યપાલક ઈજનેરશ્રીની જાણ હેઠળ, નાયબ કાર્યપાલક ઈજનેરશ્રીને
નિયુક્ત ઈજનેરના નામ, કવોલીફિકેશન, માર્કશીટ, સર્ટીફિકેટ, કલર ફોટોગ્રાફ, નિયુક્તિનો હુકમ વગેરે
વિગત રજૂ કરવાની રહેશે તથા કામ પર હાજર થયા અંગેનો રીપોર્ટ આપવાનો રહેશે. જે અનુસાર કરાર
હેઠળના કામ પર કવોલીફાઈડ ઈજનેરની ઉપરોક્ત શરત મુજબ નિયુક્તિ થાય તથા સ્થળ પર ખરેખર
કામગીરી ન સંભાળે ત્યાં મુધીના સમયગાળા તેમજ કામ ચાલુ રહે તે સમય દરમ્યાન નિયુક્તિ કરેલ ઈજનેર
કામગીરી સંભાળશે નહિ તો તે સમયગાળા માટે રૂા. ૧૫૦૦૦/- પ્રતિ માસ લેખે બીલમાંથી કપાત કરવામાં
આવશે. જે નોન રીફહેબલ રહેશે".

Signature of the Contractor :
કોન્ટ્રાક્ટરની સહી :

Signature of the Executive Engineer
કાર્યપાલક ઈજનેરની સહી :

SPECIAL CONDITIONS OF THE CONTRACT

- [1] 2% of the amount eligible for the payment of bituminous item shall be with held till the miscellaneous items like earthwork in embankment / cutting for side shoulders, side gutters, kilometer / indicator / guard stones, sign boards etc. are completed in all respect by the contractor. After completion of the miscellaneous items, the above said 2% with held amount shall be released.
- [2] Setting up of adequate laboratory & deployment of quality engineer.
- [3] The contractor shall have to set up the laboratory with adequate equipment. Till the setting up of adequate laboratory is completed & reported of this to the engineer(subject to due verification by engineers representative) by contractor in writing, Rs. 2,00,000/- shall be withheld. The qualified quality engineer shall be deployed exclusive for this contract by the contractors. If quality engineer is not deployed by contractor within one month after the date of work order, the amount equivalent to Rs. 15,000.00 per month shall be recovered till the actual deployment of quality engineer. The amount so recovered towards the deployment of quality engineer hall not be refunded.

Asphalt work will have to be cross checked as per G.R. No. RGN/60/2006/35/C Dtd. 31-05-07 before final bill is paid.

Signature of the Contractor :
նկատարի նմ :

Signature of the Executive Engineer
նկատարի նմ :

Special conditions related to Environmental and Social Management Plan (ESMP) for MMGSY

- 1) The rates to be quoted by the Contractor must be inclusive of **all taxes including Goods & Services Tax (GST)**. No extra payment on this account will be made to the Contractor. **The quoted rates shall also be inclusive of implementation of Environmental & Social Management Plan (ESMP).**

2) Environmental and Social Management Plan (ESMP)

2.1) The Contractor shall strictly implement the Environmental and Social Management Plan (ESMP) as per annexure/s herewith; which are forming express part of the Contract.

Towards ensuring full compliance of ESMP on ground it is the duty of the Contractor to get access and study, understand in full the Environmental and Social Management Framework (ESMF) for MMGSY project by R&BD-GOG. Also Smart Operational Manual, Various Formats (Linked as Annexures to ESMP) uploaded along with tender shall be studied, understood before bidding and followed strictly during implementation.

Cost of implementation of Environmental & Social Management Plan (ESMP) is incidental to the works and shall not be paid separately to the Contractor.

The Engineer-in-charge shall maintain record of compliance or non-compliance of Environmental and Social Management Plan (ESMP). On observing any non-compliances, the Engineer-in-charge shall issue a notice to the Contractor, to rectify the same. In case of any failure to rectify the non-compliance within the specified / stipulated timeframe, the Contractor is liable for penalties as stipulated in the Environmental and Social Management Plan (ESMP).

2.2) For environmental Baseline monitoring contractor shall have to carry out following quality assurance test at preconstruction stage and at construction stage

Sr. No	Category	Frequency
1	Environmental Baseline Monitoring	
	Pre-Construction	
	Air Quality	2. Samples at the time of Construction
	Noise Monitoring	
	Water Quality	
	Construction	
	Air Quality	4. Sample per year (during Construction period)
	Noise Monitoring	
	Water Quality	

2.3) After receiving work order, Contractor shall submit the detail reports pertaining to the relevant matters on implementation of Environmental and social management plan(ESMP)/ mitigation measures to the engineer in charge within 15 days".

ANNEXURE -xx TO TERMS AND CONDITIONS OF CONTRACT (Environmental and Social Management Plan (ESMP))

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

The Contractor shall implement the Environmental and Social Management Plan in line with ESMP for MMGSY project by R&BD-GOG as integral part of the scope of works.

ESMP forms express part of the Bid Document and eventually the Contract. The aspects given in ESMP are mandatory in nature and thus, the Contractor is contractually bound to abide by the same relevant to the "Contractor" under the strict supervision, guidance and instructions of the Engineer-In Charge.

It is to reiterate that the costs associated with carrying out the requirements of the ESMP are very much part of the scope of works and explicitly as incidental to the works therefore, no excuses towards non-compliance during construction shall be entertained. The Engineer-In-Charge shall regularly monitor the compliance of ESMP by the Contractor. The Contractor shall regularly monitor the implementation of ESMP.

2.1 Nonconformity of ESMP

1. The Contractor shall implement all mitigation measures for which responsibility is assigned to him as stipulated in the ESMP. Any lapse in implementing the same will attract the damage clause as detailed below:

- All lapse in obtaining clearances / permissions under statutory regulations and violations of any regulations with regard to eco-sensitive areas shall be treated as a major lapse
- Any complaints of public, within the scope of the Contractor, formally registered with the R&BD, Panchayat, Govt. of Gujarat and communicated to the Contractor, which is not properly addressed within the time period intimated by R&BD, Panchayat shall be treated as a major lapse
- Non-conformity to any of the mitigation measures stipulated in the ESMP Report (other than stated above) shall be considered as a minor lapse
- On observing any lapses, Executive Engineer R&BD (Panchayat), Govt. of Gujarat or his representative shall issue a notice to the Contractor, to rectify the same
- Any minor lapse for which notice was issued and not rectified, first and second reminders shall be given after ten days from the original notice date and first reminder date respectively. Any minor lapse, which is not rectified, shall be treated as a major lapse from the date of issuing the second reminder.
- If a major lapse is not rectified upon receiving the notice Executive Engineer R&BD (Panchayat), Govt. of Gujarat or his representative shall invoke reduction, in the subsequent interim payment certificate.
- For major lapses, 10% of the interim payment certificate will be withheld, subject to a maximum of 0.5% of the contract value
- If the lapse is not rectified within one month after withholding the payment, the amount withheld shall be forfeited.

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

1.1 ESMP Table

2. The Environmental and Social Management Plan (ESMP) is prepared to cover all the project related activities that are to be implemented during the project pre construction, construction and post construction stages. The summary of the environmental and social management plan (ESMP) is presented in **Error! Reference source not found.** below "Environmental and Social Management Plan".

Table 1-1: Environmental and Social Management Plan

Project Stage/Activity	Potential Negative Impacts	Mitigation Measures	Location	Responsible Agency	
				Implementation	Monitoring
A. Location					
Location of construction camps and contractor facilities	<ul style="list-style-type: none">Inappropriate location such as close proximity to eco-sensitive zones, biodiversity hotspots and human settlementsEnvironmentally unsound use of community resources such as forestry products by workers	<ul style="list-style-type: none">Location of construction camps at least 500m away from community areas/religious structures, and away from drinking water sources. (refer <i>Annexure – I OM – I Construction and Labour Camps</i>)The construction camps shall be located at least 1000m (1km) away from eco-sensitive zones (the boundaries of the Community reserve, Biodiversity hotspots) and 500m away from the settlementsThe camps must be located such that the drainage from and through the camps shall not affect any domestic or public water supply	Construction camp sites	Contractor	R&BD, Panchayat
Location of quarry sites	<ul style="list-style-type: none">Location in unstable areas or in sensitive areas legally and otherwise	<ul style="list-style-type: none">Only stable areas and existing or new government approved sites may be considered (refer <i>OM – I Quarry Management</i>)Consent from GPCB (Consent to establish (CTE) and Consent to operate (CTO)) is required for stone crushers and quarry sites if setting up a new unit for this project.In case sourced from third party then it shall be ensured that the construction materials are procured from approved/ licensed quarry sites and stone crushers	All parts of project area	Contractor	R&BD, Panchayat
Location of borrow pits	<ul style="list-style-type: none">Location in unstable areas or on agricultural land	<ul style="list-style-type: none">Location in area with stable soil and preferably away from agricultural land (refer <i>Annexure – I OM-2 Borrow Areas</i>)The R&BD, Panchayat shall inspect every borrow area location prior to issuing approval for use of such sites.	All parts of project area	Contractor	R&BD, Panchayat
Crushers, Hot-mix Plants & Batching Plants	<ul style="list-style-type: none">Delays in processing clearances, causing delays in initiation of construction	<ul style="list-style-type: none">Processing of clearances/permits on a timely basis and keeping in mind the time requirements for these clearances (refer <i>Annexure – I OM-7 Construction Plants & Equipment Management</i>)The contractor shall follow all stipulated conditions for pollution control as suggested by the GPCB in the consent/ NoC for establishing and operating the Hot-mix and Batching Plant.	All camps or plant location	Contractor	R&BD, Panchayat
B. Construction					
Alignment / road passing through coastal region	<ul style="list-style-type: none">Corrosion in reinforcement of road furniture, Sulphate attack on asphaltic surface and Blisters formation on road surface	<ul style="list-style-type: none">Careful surface brooming of the base should be carried out to remove the salts before the bituminous surfacing is appliedDuring Construction the Aggregates should be stored in a place away from moisture and in a dry place	Roads near / close in vicinity of coastal region	Contractor	R&BD, Panchayat

Establishment and shifting of construction camps	<ul style="list-style-type: none"> Deforestation and poaching by laborers Improper waste disposal Disturbance to aesthetic beauty Disturbance to nearby settlements Unfriendly use of community resources such as non-timber forestry products by construction workers Leaving dirty and waste material after shifting from one camp site to another Obstruction of drainage, disturbance/safety hazard to road users, etc Dust generation from stock pile area 	<ul style="list-style-type: none"> Provision of cooking fuel to contractors' staff References to the illegality of cutting trees, hunting and fishing, and other prohibited activities in community areas to be included in contract documents Provision of proper waste disposal facilities and health & safety facilities Prior information to nearby communities of camp establishment Ensure clean area left behind when shifting camp 	All parts of project road	Contractor	R&BD, Panchayat
Stockpiling of construction materials	<ul style="list-style-type: none"> Negative changes in micro-level wildlife habitat/environment Soil erosion Scarring of landscape Soil erosion and landslides Scarring of landscape because of improper disposal of debris Dust pollution Disruption of local drainage Siltation in nearby water bodies and consequent negative effects on aquatic ecology Noise and disturbance to nearby communities 	<ul style="list-style-type: none"> Due consideration shall be given for material storage and construction sites such that it doesn't cause Obstruction of drainage, disturbance/ safety hazard to road users, etc Stockpiles shall be covered to protect from dust and erosion Design shall be prepared to minimize the loss of avenue trees If impacts on trees become unavoidable, compensatory tree plantation shall be carried out 	All parts of project road	Contractor	R&BD, Panchayat
Removal of vegetation and uprooting of trees	<ul style="list-style-type: none"> Negative changes in micro-level wildlife habitat/environment Soil erosion Scarring of landscape Soil erosion and landslides Scarring of landscape because of improper disposal of debris Dust pollution Disruption of local drainage Siltation in nearby water bodies and consequent negative effects on aquatic ecology Noise and disturbance to nearby communities 	<ul style="list-style-type: none"> Confine cutting activities to dry season (refer OM-3 Slope Stability and Erosion Control) Use standard method Disposal of debris at proper sites or reuse material for construction Proper restoration of borrow areas Provision of appropriate drainage structures/facilities Confine construction activities to daytime 	All parts of project road	Contractor	R&BD, Panchayat
Cutting of hill slope and earth removal from borrow areas	<ul style="list-style-type: none"> Negative changes in micro-level wildlife habitat/environment Soil erosion Scarring of landscape Soil erosion and landslides Scarring of landscape because of improper disposal of debris Dust pollution Disruption of local drainage Siltation in nearby water bodies and consequent negative effects on aquatic ecology Noise and disturbance to nearby communities 	<ul style="list-style-type: none"> Confine cutting activities to dry season (refer OM-3 Slope Stability and Erosion Control) Use standard method Disposal of debris at proper sites or reuse material for construction Proper restoration of borrow areas Provision of appropriate drainage structures/facilities Confine construction activities to daytime 	Hilly terrain and borrow areas	Contractor	R&BD, Panchayat
Quarrying / Borrow pits Operations	<ul style="list-style-type: none"> Landslides (rock slides/falls) Scarring of landscape Disturbance to wildlife and nearby communities from blasting 	<ul style="list-style-type: none"> Adequate safety precautions shall be ensured during transportation of quarry material from quarries to the construction site (refer Annexure - 1 OM-2 Borrow area, OM-3 Quarry Management) Vehicles transporting the material shall be covered to prevent spillage Operations to be undertaken by the Contractor as per the direction and satisfaction of the R&BD, Panchayat/PMC All borrow areas shall be restored to the original condition, immediately upon completion of the use of such a source 	Quarry sites	Contractor	R&BD, Panchayat
Crushing of stone and transport of stone/materials	<ul style="list-style-type: none"> Dust pollution affecting construction laborers and local vegetation Air pollution from machinery and vehicle exhausts Noise pollution and disturbance to nearby wildlife and communities 	<ul style="list-style-type: none"> Water sprinkling of stone crushing site Proper covers for vehicles transporting stone and materials Regular maintenance of machinery and vehicles Confine stone crushing and transportation activities to daytime 	Stone crushing sites and all parts of project road	Contractor	R&BD, Panchayat
Road activities	<ul style="list-style-type: none"> Air pollution from smoke and gaseous emissions affecting health of workers Disruption of local stream/river courses and aquatic hydrology Increased sediments in rivers or streams 	<ul style="list-style-type: none"> Provide masks to workers exposed to dust and smoke Manage movement of vehicles during road surfacing work Provision of appropriate drainage facilities and river/stream diversion structures (item to be included in BOQ) 	All parts of project road	Contractor	R&BD, Panchayat
Construction of line and cross drainage structures and bridges	<ul style="list-style-type: none"> Air pollution from smoke and gaseous emissions affecting health of workers Disruption of local stream/river courses and aquatic hydrology Increased sediments in rivers or streams 	<ul style="list-style-type: none"> Provide masks to workers exposed to dust and smoke Manage movement of vehicles during road surfacing work Provision of appropriate drainage facilities and river/stream diversion structures (item to be included in BOQ) 	All parts of project road	Contractor	R&BD, Panchayat

Operation of machinery and equipment and general activities of laborers	<ul style="list-style-type: none"> Spillage/ leakage of chemicals and oil and contamination of soil and water resources Injury to workers/others Respiratory problems from dust and machinery emissions Hearing problems due to high level of noise Misuse of community water resources 	<ul style="list-style-type: none"> Proper storage and handling of chemicals and oil (<i>refer Annexure – 1 OM-7 Construction Plants & Equipment Management</i>) Provision of workers with construction hats, face masks, earplugs, gloves, etc. Provision of well-equipped first aid kits and health facilities at construction camp and work sites 	All parts of project road	Contractor	R&BD, Panchayat
Water sourcing for domestic usage or construction work		<ul style="list-style-type: none"> Independent arrangements to be made for water requirements so that supplies to nearby communities remains unaffected (<i>refer Annexure – 1 OM-4 Water for Construction & refer Annexure 2 NoC format for water resource</i>) 	Construction camps	Contractor	R&BD, Panchayat
Material Handling at Site	<ul style="list-style-type: none"> Exposure of workers to dust and heat Worker's safety in handling and storage of material 	<ul style="list-style-type: none"> All workers employed on mixing asphaltic material, cement, lime mortars, concrete etc., shall be provided with protective footwear and protective goggles (<i>refer Annexure – 1 OM-8 Labour and Worker's Health and Safety</i>) Workers, who are engaged in welding works, shall be provided with welder's protective eye-shields Workers engaged in stone breaking activities shall be provided with protective goggles and clothing and shall be seated at sufficiently safe intervals 	All parts of project road	Contractor	R&BD, Panchayat
Disposal of Construction Waste / Debris / Cut Material	<ul style="list-style-type: none"> Location impacts (including change in topography, landscaping etc.) 	<ul style="list-style-type: none"> The waste generated shall be reused in the construction activities to the maximum extent possible. Cut and fill material shall be balanced so as not to have requirement for disposal. Remaining material if any shall be disposed off safely at the disposal sites (<i>refer Annexure – 1 OM-6 Waste Management and Debris Disposal</i>). Safe disposal of the extraneous material shall be ensured in the pre-identified disposal locations. In no case, any construction waste shall be disposed around the sub-project locations indiscriminately. Cut material generated because of cutting of slopes shall be utilized for construction of retaining walls, embankments and as filling material 	All parts of project road	Contractor	R&BD, Panchayat
Safety Measures During Construction	<ul style="list-style-type: none"> Accident impacts 	<ul style="list-style-type: none"> Personal Protective Equipment (PPE's) for workers on the project and adequate safety measures for workers during handling of materials at site shall be taken up (<i>refer Annexure – 1 OM-8 Labour and Worker's Health and Safety</i>) The contractor has to comply with all regulations regarding occupational health and safety 	All parts of project road	Contractor	R&BD, Panchayat
Chance finds of archaeological Property / remains	<ul style="list-style-type: none"> Damage to archaeological Property / remains in the performance of project activities 	<ul style="list-style-type: none"> The Contractor shall immediately upon discovery of a chance find of archaeological Property / remains stop the work and inform R&BD, Panchayat/PMC of such discovery and carry out the R&BD, Panchayat/PMC instructions for dealing with the same, awaiting which all work will be stopped The R&BD, Panchayat/PMC shall seek direction from the Archaeologist at the Department of Archaeology before instructing the Contractor to recommence work on the site 	All parts of project road	Contractor	R&BD, Panchayat

Annexures to the ESMP

ANNEXURE -1: SMART Operational Manual

OM – 1: CONSTRUCTION AND LABOUR CAMPS

1. INTRODUCTION

1. The scope of this guideline pertains to the siting, development, management and restoration of construction and labour camps to avoid or mitigate impacts on the environment. The area requirement for the construction camp shall depend upon the size of contract, number of labourers employed and the extent of machinery deployed. The following sections describe the siting, construction, maintenance, provision of facilities in the camps and finally rehabilitation of the construction and labour camps. These are described in three stages, pre-construction, construction and post-construction stage. The issues related to construction camps are similar in the case of road construction and hence have been taken together.

2. PRE-CONSTRUCTION STAGE

2. Identification of site for construction and labour camps is the first task. The Contractor shall identify the site for construction camp in consultation with the individual owners in case of private lands and the concerned department in case of Government lands. The suitable sites shall be selected and finalized in consultation with R&BD (Panchayat) Table 1-1 gives the lands that could be avoided for construction camps and conversely those that could be preferred.

Table 1-1: Selection Criterion for Construction Camps.

Avoid the following ...	Prefer the following ...
<ul style="list-style-type: none"> • Lands close to habitations. • Irrigated agricultural lands. • Lands belonging to small farmers. • Lands under village forests. Lands within 100m of community water bodies and water sources as rivers. • Lands within 100m of watercourses. • Low lying lands. • Lands supporting dense vegetation. • Grazing lands and lands with tenure rights. • Lands where there is no willingness of the landowner to permit its use. 	<ul style="list-style-type: none"> • Waste lands. • Waste Lands belonging to owners who look upon the temporary use as a source of income. • Community lands or government land not used for beneficial purposes. • Private non-irrigated lands where the owner is willing. • Lands with an existing access road.

3. The contractor will work out arrangements for setting up his facilities during the duration of construction with the land owner/concerned department. These arrangements shall be in the form of written agreement between the contractor and the land owner (private/government) that would specify:

- a) photograph of the proposed camp site in original condition;
- b) activities to be carried out in the site;
- c) environmental mitigation measures to be undertaken to prevent land, air, water and noise pollution;
- d) detailed layout plan for development of the construction and labour camp that shall indicate the various structures to be constructed in the camp including temporary, drainage and other facilities (**Figure 1-1** gives a layout plan for a construction camp); and
- e) Restoration plan of camp site to previous camp conditions.

Arrangements with Land owners...

The Contractor shall submit to R&BD (Panchayat) the following:

- Written No Object Certification from respective land owner/Cultivator
- Extent of land required and duration of the agreement
- Photograph of site in original condition
- Details of site after redevelopment after completion

[illegible]

2.2 Setting up of labour camp

a) Drinking Water

- The contractor shall provide for a continuous and sufficient supply of potable water in the camps, in earthen pots or any other suitable containers.
- The contractor shall identify suitable community water sources for drinking. Only in the event of non-availability of other sources of potable water, the Contractor shall obtain water from an unprotected source only after the testing for its potability. Where water has to be drawn from an existing open well, the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be entirely closed in and be provided with dust proof trap door.
- Every water supply or storage shall be at a distance of not less than 15m from any wastewater / sewage drain or other source of pollution. Water sources within 15m proximity of toilet, drain or any source of pollution will not be used as a source of drinking water in the project.
- A pump shall be fitted to covered well used as drinking water source; the trap door shall be kept locked and opened only for cleaning or inspection, which shall be done at least once a month.

7. In every site, adequate and suitable facilities for washing clothes and utensils shall be provided and maintained for the use of contract labor employed therein. Separate and adequate bathing shall be provided for the use of male and female workers. Such facilities shall be conveniently accessible and shall be kept in clean and hygienic conditions.

8. Sanitary arrangements, latrines and urinals shall be provided in every work place separately for male and female workers. The arrangements shall include:

- A latrine for every 15 females or part thereof (where female workers are employed).
- A latrine for every 10 males.
- Every latrine shall be under cover and so partitioned as to secure privacy, and shall have a proper door.

and fastenings.

- Where workers of both sexes are employed, there shall be displayed outside each block of latrine and urinal, a notice in the language understood by the majority of the workers "For Men Only" or "For Women Only" as the case may be.
- The latrines and urinals shall be adequately lighted and shall be maintained in a clean sanitary condition at all times and should have a proper drainage system;
- Water shall be provided in or near the latrines and urinals by storage in suitable containers.

d) Waste Disposal

- Disposal of sanitary wastes and excreta shall be into septic tanks.
- Kitchen waste water shall be disposed into soak pits/kitchen sump located preferably at least 15 meters from any water body. Sump capacity should be at least 1.3 times the maximum volume of wastewater discharged per day. The bottom of the pit should be filled with coarse gravel and the sides shored up with board, etc. to prevent erosion and collapse of the pit. New soak pits shall be made ready as soon as the earlier one is filled.
- Solid wastes generated in the kitchen shall be reused if recyclable or disposed off in land fill sites.

e) Medical and First Aid Facilities

9. Medical facilities shall be provided to the labour at the construction camp. Visits of doctor shall be arranged twice a month wherein routine check-ups would be conducted for women and children. A separate room for medical check-ups and keeping of first aid facilities should be built. The site medical room should display awareness posters on safety facilitation hygiene and HIV/AIDS awareness.

- First Aid Box will be provided at every construction campsite and under the charge of a responsible person who shall always be readily available during working hours. He shall be adequately trained in administering first aid-treatment. Formal arrangement shall be prescribed to carry injured person or person suddenly taken ill to the nearest hospital. The first aid box shall contain the following.
- 6 small sterilized dressings
- 3 medium size sterilized dressings
- 3 large size sterilized dressings
- 3 large sterilized burns dressings
- 1 (30 ml) bottle containing 2 % alcoholic solution of iodine
- 1 (30 ml) bottle containing salvolatile
- 1 snakebite lancet
- 1 (30 gms) bottle of potassium permanganate crystals
- 1 pair scissors
- Ointment for burns
- A bottle of suitable surgical antiseptic solution

In case, the number of labour exceeds 50, the items in the first aid box shall be doubled.

f) Provision of Shelter during Rest

10. The work place shall provide four suitable sheds, two for meals and two for rest (separately for men and women). The height of the shelter shall not be less than 3.0m from the floor level to the lowest part of the roof. These shall be kept clean.

g) Crèches

11. In case 30 or more women workers are employed, there shall be a room of reasonable size for use of children under the age of six years. The room should have adequate light and realisation. A caretaker is to be appointed to look after the children. The use of the room shall be restricted to children, their mothers and the caretaker.

2.1 Storage of Construction Material in Construction Camps

12. For storage of Petrol/Oil/Lubricants, brick on edge flooring or sand flooring will be provided at the storage places of Petrol/Oil/Lubricants to avoid soil and water contamination due to spillage. These should be kept away from labour residential areas. The storage of cement shall be at Damp-proof flooring, as per IS codes. All materials shall be stored in a barricaded area. In case of electrical equipment, danger signs shall be

posted. The batch mix plant is to be located away from the residential area and not in the wind direction. Separate parking areas for vehicles and also workshop areas need to be provided.

2.2 Firefighting arrangement

The following precautions need to be taken:

- Demarcation of area susceptible to fires with cautionary signage;
- Portable fire extinguishers and/or sand baskets shall be provided at easily accessible locations in the event of fire;
- Contractor shall educate the workers on usage of these equipment.

2.3 Interactions with host communities

13. To ensure that there is no conflict of the migrant labor with the host communities, the contractor shall issue identity cards to labourers and residents of construction camps.

3. CONSTRUCTION STAGE

14. Construction camps shall be maintained free from litter and in hygienic condition. It should be kept free from spillage of oil, grease or bitumen. Any spillage should be cleaned immediately to avoid pollution of soil, water stored or adjacent water bodies. The following precautions need to be taken in construction camps.

- Measures to ensure that no leaching of oil and grease into water bodies or underground water takes place.
- Wastewater should not be disposed into water bodies.
- Regular collection of solid wastes should be undertaken and should be disposed off safely.
- All consumables as the first aid equipment, cleaning equipment for maintaining hygiene and sanitation should be recouped immediately.
- The debris/scrap generated during construction should be kept in a designated and barricaded area.

15. The Engineer –in-charge will monitor the cleanliness of construction campsites and ensure that the sites are properly maintained throughout the period of the contract.

4. POST CONSTRUCTION STAGE

16. At the completion of construction, all construction camp facilities shall be dismantled and removed from the site. The site shall be restored to a condition in no way inferior to the condition prior to commencement of the works. Various activities to be carried out for site rehabilitation include:

- Oil and fuel contaminated soil shall be removed and transported and buried in waste disposal areas.
- Soak pits, septic tanks shall be covered and effectively sealed off.
- Debris (rejected material) should be disposed off suitably (Refer OM-6 on "Waste Management and Debris Disposal").
- Ramps created should be levelled.
- Underground water tank in a barren/non-agricultural land can be covered. However, in an agricultural land, the tank shall be removed.
- If the construction camp site is on an agricultural land, top soil can be spread so as to aid faster rejuvenation.
- Proper documentation of rehabilitation site is necessary. This shall include the following: Photograph of rehabilitated site;
- Land owner consent letter for satisfaction in measures taken for rehabilitation of site;
- Undertaking from contractor; and
- Certification from the Engineer-in-charge.

17. In cases, where the construction camps site is located on a private land holding, the contractor would still have to restore the campsite as per this guideline. Also, he would have to obtain a certificate for satisfaction from the landowner.

OM – 2: BORROW AREAS

1. INTRODUCTION

1. Embankment fill material is to be procured from borrow areas designated for the purpose. Borrow areas can cause significant adverse environmental impacts if appropriate mitigation measures are not taken. The scope of this guideline is to include measures that are required during project planning and design stage, pre-construction, construction stage and post construction stage. Borrow areas are related only to road construction activities.

2. PROJECT PLANNING AND DESIGN STAGE

2. Design measures must be implemented with a focus to reduce the quantity of material extracted and consequently decrease the borrow area requirement. Borrow area siting should be in compliance with IRC: 10-1961. The DPR shall contain (i) Guidelines for locating site of borrow areas and borrow material specifications.

3. PRE-CONSTRUCTION STAGE

3. The contractor shall identify the borrow area locations in consultation with the individual owners in case of private lands and the concerned department in case of government lands, after assessing suitability of material. The suitable sites shall be selected and finalized in consultation with the Engineer-in-charge. Borrowing are to be avoided in the following areas:

- Lands close to toe line.
- Irrigated agricultural lands (In case of necessity for borrowing from such lands, the topsoil shall be preserved in stockpiles. The subsequent Guidelines detail the conservation of topsoil).
- Grazing land.
- Lands within 0.8km of settlements.
- Environmental sensitive areas such as Reserve Forests, Protected Forests, Sanctuary, wetlands. Also, a distance of 1000 m should be maintained from such areas.
- Designated protected areas / forests.
- Unstable side-hills.
- Water-bodies.
- Streams and seepage areas.
- Areas supporting rare plant/ animal species;
- Ensure soft rock is not prominent within the proposed depth of excavation as it will render rehabilitation difficult.

3.1 Arrangements for Borrow Area

4. The Contractor will work out arrangements for borrowing with the land owner/concerned department of Commissioner of Geology and Mining, Govt. of Gujarat for necessary approval (Online application of Mining lease are available in the website: http://cgm.ncode.in/LeaseHolder/AppPages/Quarry_Lease.aspx).

5. The arrangements will include the redevelopment after completion of borrowing. The arrangements will be verified by the Engineer-in-charge to enable redressal of grievances at a later stage of the project. The Engineer –in-charge shall approve the borrow area after inspection of the site to verify the reclamation plan and its suitability with the contractor and landowner. The contractor shall commence borrowing soil only after the approval by the Engineer-in-charge. The contractor shall submit to the Engineer-in-charge the following before beginning work on the borrow areas.

- Written No-objection certificate of the owner/cultivator;
- Estimate extent of earth requires;
- Extent of land required and duration of the agreement;
- Photograph of the site in original condition; and
- Site redevelopment plan after completion.

6. The depth of excavation should be decided based on natural ground level of the land and its surroundings, as well as based on the rehabilitation plan. In case higher depth of excavation is agreed by backfilling using unsuitable excavated soil (from roadway), in those cases filling should be adequately compacted except for topsoil, which has to be spread on the top most layer (for at least 20m thick).

7. The guidelines for location, depth, size and shape of the borrow areas are available in the following:

- Clause 305.2.2.2 of MoRTH specification for roads and bridge works of IRC;
- Guidelines for environmental impact assessment of highway projects, Indian Roads Congress, 1989; (IRC: 104-1988);
- IRC: 10-1961-Recommended practice for borrow pits for road embankments constructed by manual operations, as revised in 1989;
- IRC SP: 58-2001 guideline for use of fly ash in road construction;
- EIA manual of MoEF& CC, 2010;
- MoEF& CC, GoI Notification on utilization of fly ash dated 27th August, 2005 and subsequent amendments thereafter.

3.2 Documentation of Borrow Pit

8. The contractor must ensure that following database must be documented for each identified borrow areas that provide the basis of the redevelopment plan.

- Chainage along with offset distance;
- Area (Sq.m);
- Photograph of the pit from all sides;
- Type of access/width/kutcha/pucca etc from the carriageway;
- Soil type;
- Slope/drainage characteristics;
- Water table of the area or identify from the nearest well, etc;
- Existing landuse, for example barren/agricultural/grazing land;
- Location/name/population of the nearest settlement from borrow area;
- Present usage of borrow area; and
- Community facility in the vicinity of borrow pit.

3.3 Redevelopment Plans for Borrow Pits

9. The following checklist provides guidelines in order to ensure that redevelopment of borrow areas must comply with MoRTH, clause 305.2.2.2 and EMP requirement. Borrow areas can be developed as:

- Ponds (various types) (eg: Drinking Water only; Washing and for other Domestic Chores; Only for Cattle; Mixed Uses etc.) (a large pond can be divided into two parts - each having a defined use)
- Farmland submission
- Water Recharging Zones
- Pastureland
- Fish Ponds (pisciculture)
- Waste disposal Sites (depending upon the location, distance from settlements, pollution risks, safety, associated environmental risks and hazards, regulations/ permissions of appropriate authority and other such factors)
- Plantation Zones
- Recreational Zones (depending upon location, size, potential of the site, willingness of the local bodies to develop it)
- Wildlife Refuge and Drinking Area (applicable only in case of sensitive environs with appropriate planning and understanding including regulation of depth for safety of animals etc.)

10. The rehabilitation measures for the borrow areas shall be dependent on the following factors:

- Land use objectives and agreed post-borrowing activities;
- Physical aspects (landform stability, erosion, re-establishment of drainage);
- Biological aspects (species richness, plant density,) for areas of native re vegetation;

- Water quality and soil standards; and
- Public safety issues.

11. **Rehabilitation should be simple and maintenance free.** Depending on the choice of the individual land owner/community, the contractor shall prepare redevelopment plans for the borrow areas. The options can be: (i) Restoring the productive use of the land (ii) Development of detention ponds in barren areas.

Option I: Suitable in locations with high rainfall and productive areas

12. Topsoil must be placed, seeded, and mulched within 30 days of final grading if it is within a current growing season or within 30 days of the start of the next growing season. Vegetative material used in reclamation must consist of grasses, legumes, herbaceous, or woody plants or a combination thereof, useful to the community for the fuel and fodder needs.

13. Plants must be planted during the first growing season following the reclamation phase.

14. Selection and use of vegetative cover must take into account soil and site characteristics such as drainage, pH, nutrient availability, and climate to ensure permanent growth. The vegetative cover is acceptable if within one growing season of seeding, the planting of trees and shrubs results in a permanent stand, or regeneration and succession rate, sufficient to assure a 75% survival rate.

Option II: In barren land, the borrow areas can be redeveloped into detention ponds.

15. These will be doubled up as water bodies and also for removal of sediment from runoff flowing through the ponds. Design of the detention basin depends upon the particle size, settling characteristics, residence time and land area. A minimum of 0.02 mm size particle with a settling velocity of 0.02 cm/sec (assuming specific gravity of solids 2.65) can be settled in the detention basin.

Following parameters are to be observed while setting up a detention pond:

- Pond should be located at the lowest point in the catchment area. Care should be taken that the horizontal velocity should be less than settling velocity to prevent suspension or erosion of deposited materials.
- Minimum Effective Flow Path: 5 times the effective width
- Minimum Free Board: 0.15 m
- Minimum Free Settling Depth: 0.5 m
- Minimum Sediments Storage Depth: 0.5 m
- Maximum interior slope: 2H : 1V
- Maximum exterior slope: 3H : 1V

16. The inlet structure should be such that incoming flow should be distributed across the width of the pond. A pre-treatment sump with a screen should be provided to remove coarse sediments. Settled sediment should be removed after each storm event or when the sediment capacity has exceeded 33% of design sediment storage volume. Accumulated sediment must be disposed off in a manner, which will prevent its re-entry into the site drainage system, or into any watercourse.

4. CONSTRUCTION STAGE

17. No borrow area shall be operated without permission of the Engineer -in charge. The procurement of borrow material should be in conformity to the guidelines laid down in IRC: 10-1961. In addition, the contractor should adopt precautionary measures to minimise any adverse impacts on the environment. Checklists for monitoring borrow areas operation and management has been prepared (**Table 2-1**).

Table 2-1: Checklist for Monitoring Borrow Area Operation and Management

Attributes	Requirements
Access Road	Access road shall be used for hauling only after approved
Top soil preservation	To soil, if any, shall be stripped and stored at corners of the area before the start of excavation for material collection. Top soil should be reused / re-laid as per agreed plan. In case of riverside, borrow pit should be located not less than 15m from the toe of the bank, distance depending on the magnitude and duration of flood to be withstood. In no case shall borrow pit be within 15m from the Toe line of the proposed embankment.
Depth of excavation	For agricultural land, the total depth of excavation should be limited to 150cm including top 30 cm for top soil preservation. For river side borrow area, the depth of excavation shall be regulated so that the inner edge of any borrow pit, should not be less than 15m from the toe of the bank and bottom of the pit should not cut

Attributes	Requirements
Damage to surrounding land	the imaginary line of 1:4 projected from the edge of the final section of the embankment. To avoid any embankment slippage, the borrow areas will not be dug continuously, and the size and shape of borrow pits will be decided by the Engineer -in charge Movement of man and machinery should be regulated to avoid damage to surrounding land. To prevent damages to adjacent properties, the Contractor shall ensure that an undisturbed buffer zone exists between the distributed borrow areas and adjacent land. Buffer zone shall be 3 m wide or equal to the depth of excavation whichever is greater.
Drainage control	The Contractor shall maintain erosion and drainage control in the vicinity of all borrow pits and make sure that surface drains do not affect the adjacent land or future reclamation. This needs to be rechecked by the Engineer-In-charge
Dust Suppression	Water should be sprayed on kutchra haul road twice a day or as may be required to avoid dust generation during transportation of material. Depending on moisture content, 0.5 to 1.5% water may be added to excavated soil before loading during dry weather to avoid fugitive dust emission.
Covering material for transport material	Material transport shall be provided with tarpaulin cover
Personal Protective Equipment	Workers should be provided with helmet, gumhoots and air mask and their use should be strictly enforced
Redevelopment	The area should be redeveloped within agreed timeframe on completion of material collection as per agreed rehabilitation plan.

5. POST CONSTRUCTION STAGE

18. All reclamation shall begin within one month of abandonment of borrow area, in accordance with the redevelopment plan. The site shall be inspected by the Engineer-in-charge after implementation of the reclamation plan. Certificate of Completion of Reclamation is to be obtained by the Contractor from the landowner that "the land is restored to his satisfaction". The final payment shall be made after the verification by the Engineer-In-charge or his representative.

6. CHECKLIST FOR INSPECTION OF REHABILITATION AREA

19. Inspection needs to be carried out by the Engineer-In-charge or his representative for overseeing the redevelopment of borrows areas as per the plan. The checklist for the inspection by the Engineer-In-charge or his representative is given below.

- Compliance of post-borrowing activities and land use with the restoration plan;
- Drainage measures taken for inflow and outflow in case borrow pit is developed as a detention pond;
- Levelling of the bottom of the borrow areas;
- In case the borrow area is on private property, the contractor shall procure written letter from landowner for satisfaction on rehabilitation. In case of no rehabilitation is desired by the landowner, the letter should include statement "no responsibility of R&BD, Panchayat on contractor in the event of accident.
- Condition of the reclaimed area in comparison with the pre-borrowing conditions.

OM – 3: QUARRY MANAGEMENT

1. INTRODUCTION

1. This guideline pertains to the measures to be taken to address environmental concerns in quarry areas. The general practice adopted is to procure materials from existing quarries operating with the requisite permits. The measures to be taken for operation and management for quarries during all stages of construction have been discussed in this Guideline.

2. PROJECT PLANNING AND DESIGN STAGE

2. R&BD (Panchayat) shall provide in the DPR / bid document, a list of licensed quarries operating within the district and adjoining districts. In addition, the DPR shall contain the following: (i) Quantity of materials available in quarries (ii) Lead from the various existing quarries and (iii) Adequacy of materials for the project in these quarries. Table 3-1 and 3-2 give the format for preparing a list of quarries.

Table 3-1 Details of Sand Quarry

Sample No.	Source of Sand	Name of quarry area	Site Identification/ Location			Approximate Quantity (cum)	Approximate basic cost of the material (Rs.)	Remarks
			Nearest Chainage (Km.)	Left/Right	Offset from nearest chainage (km)			

Table 3-2 Details of Quarry Area for Aggregates

Sample No.	Chainages (Km.)	Left/ Right	Name of Quarry Area	Name of Crusher	Lead from nearest chainage (Km.)	Basic cost of the material (Rs.)	Available land/terrain	Surrounding land Terrain	Remarks
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3. In the event of non-availability of existing quarries, the Contractor shall open a new quarry in accordance with Mines and Minerals (Development & Regulation) Act, 1957 (Online application of Mining lease are available in the website: http://cgmn.ncode.in/LeaseHolder/AppPages/Quarry_Lease.aspx).

4. The bid document shall include the exhaust quarry reclaim plan as per needs of the landowner / community.

3. PRE-CONSTRUCTION STAGE

5. The Contractor shall select an existing licensed quarry identified in DPR for procuring materials. The Contractor shall establish a new quarry with the prior consent of the Engineer-In-charge only in cases when: (i) Lead from existing quarries is uneconomical and (ii) Alternative material sources are not available. The Contractor shall prepare a Redevelopment Plan for the quarry site and get it approved by the Engineer.

6. The construction schedule and operations plans to be submitted to the Engineer-in-charge prior to commencement of work shall contain a detailed work plan for procuring materials that includes procurement, transportation and storage of quarry materials.

4. CONSTRUCTION STAGE

4.1 Development of Quarry Area

7. To minimize the adverse impact during excavation of material following measures are need to be undertaken:

- Adequate drainage system shall be provided to prevent the flooding of the excavated area
- At the stockpiling locations, the Contractor shall construct sediment barriers to prevent the erosion of excavated material due to runoff.
- Construction of offices, laboratory, workshop and rest places shall be done in the up-wind of the plant to minimize the adverse impact due to dust and noise.
- The access road to the plant shall be constructed taking into consideration location of units and also slope of the ground to regulate the vehicle movement within the plant.
- In case of storage of blasting material, all precautions shall be taken as per The Explosive Rules, 1983.

4.2 Setting up of Crushers and other equipment

8. The following measures shall be undertaken for setting up of crushers is other equipment.

- The contractor shall obtain "No Objection Certificate (NoC)" from the Gujarat State Pollution Control Board.
- All vehicles must possess Pollution Under Control (PUC) Certificate and shall be renewed accordingly
- All machinery, equipment, and vehicles shall comply with existing CPCB noise and emission norms.
- The Engineer must ensure that contractor shall submit the copy of NoC and PUC Certificate before the start of work.

4.3 Quarry operations

9. The followings precautions shall be undertaken during quarry operations. vii) Overburden shall be removed and disposed as per **Guideline 8** "Waste Management and Debris Disposal".

- During excavation slopes shall be flatter than 20 degrees Guideline 8 on to prevent their sliding
- In case of blasting, the procedure and safety measures shall be taken as per The Explosive Rules, 1983
- The Contractor shall ensure that all workers related safety measures shall be done as per measures for, "Labour & Workers Health & Safety" (**OM-8**).
- The Contractor shall ensure maintenance of crushers regularly as per manufacturer's recommendation.
- Stockpiling of the excavated material shall be done
- During transportation of the material, measures shall be taken as per **OM-7** "Construction Plants and Equipment Management" to minimize the generation of dust and to prevent accidents
- The Engineer-in-charge and the concerned authority shall review the quarry site for the management measures during quarry operation, including the compliance to pollution norms.

5. POST CONSTRUCTION STAGE

10. A quarry redevelopment plan shall be prepared by the Contractor. All haul roads constructed for transporting the material from the quarries to construction site shall be restored to their original state.

11. The Engineer and the concerned authority shall be entrusted the responsibility of reviewing the quarry site for the progress of implementation of Redevelopment Plan.

12. The plan shall include:

- Photograph of the quarry site prior to commencement
- The quarry boundaries as well as location of the materials deposits, working equipment, stockpiling, access roads and final shape of the pit.
- Drainage and erosion control measures at site
- Safety measures during quarry operation
- Design for redevelopment of exhaust site.

Two options for redevelopment of quarry areas are given below:

Option A: Vegetating the quarry to merge with surrounding landscape. This is done by conserving and reapplying the topsoil for the vegetative growth.

Option B: Developing exhausted quarries as water bodies. The pit shall be reshaped and developed into pond, for harvesting rainwater. This option shall only be considered where the location of quarry is at the lowest point, i.e. surrounding areas/ natural drainage slopes towards it.

OM – 4: WATER FOR CONSTRUCTION

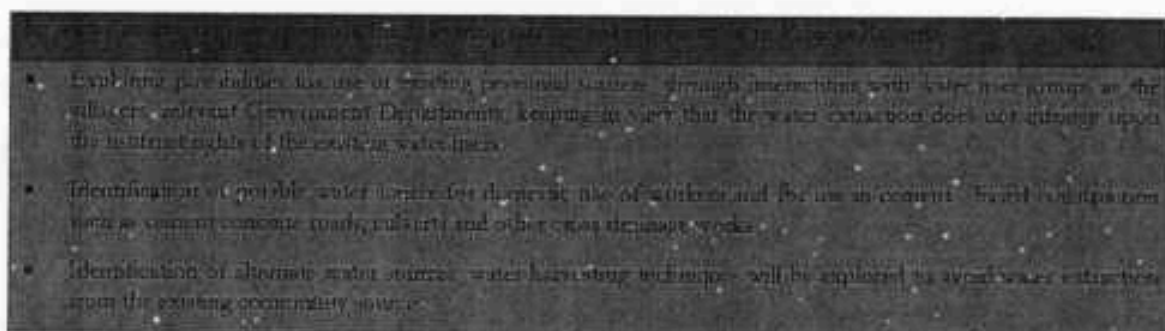
1. INTRODUCTION

1. The scope of this guideline includes the procurement of water required for construction of roads. Except bituminous works, water is required during all stages of road construction such as Embankment Sub-Grade; Granular sub-base (GSB) and Water Bound Macadam (WBM). Management of water in various stages of construction is given in the following sections.

2. PROJECT PLANNING & DESIGN STAGE

2. The DPR for the road constructions shall contain the following information:

- Estimate of water requirement during different seasons based on construction schedule of various stages of construction.
- Identification of potential sources of water for construction,
- Arrangements to be worked out by the contractor with individual owners, when water is obtained from private sources, and
- Whether scarcity of water would have any impact on schedule of construction.



3. In water scarce regions, if water-harvesting structures are to be constructed, suitable locations and mechanism for siting these structures will be identified. These are envisaged to be permanent water tanks for collection of stream water. Detailed drawings of water harvesting structures based on site conditions will need to be worked out and presented in the DPR. No extra payment shall be generally made for these works and the Contractor has to include the cost of these items in his offer while quoting his tendered rate.

4. Scheduling Construction in Water Scarce Areas: As part of the project preparation, the Engineer-in-charge shall conduct an assessment of water requirement and availability in water scarce regions. As far as possible, schedule for construction in these water scarce areas shall be prepared such that earthwork for embankment is carried out just before monsoon, so that water requirement for subsequent construction works such as granular sub-base and water bound macadam are met in monsoon and post monsoon season. Carrying out these activities even during the monsoon is possible as the rainfall may not be high enough to disrupt construction.

3. PRE-CONSTRUCTION STAGE

5. Prior to commencement of extraction of water for construction, the contractor shall work out arrangements as specified in the DPR.

<ul style="list-style-type: none"> Establishing guidelines together of various potential sources through consultation with a project village or the village, the local Government/Department keeping in view that the water extraction does not affect any of the existing norms of the existing water use. Identification of suitable water sources for domestic use of workers shall be done in advance. Based on availability of water, concrete curing, masonry and other construction work shall be done. Identification of alternate water source for water harvesting technology will be explored to avoid water extraction from the existing natural source. Install any septic tank or other water treatment pollution. In case of water harvesting structures is required, the contractor shall in consultation with the residents, identify suitable locations for siting the structure and construct the same. In case of potential sources, the Contractor shall adhere to all administrative procedures pertaining to procurement of water from such sources.

CONSTRUCTION STAGE

6. During construction, the Contractor shall be responsible to monitor the following:
 - The arrangements worked out with the Panchayat/individual land owners for water extraction is adhered to;
 - Extraction of water is restricted to construction requirement and domestic use of construction workers;
 - Water requirement for curing of concrete shall be minimized by pooling of water over the concrete or by covering with wet gunny bags; and
 - The potable water used for drinking purposes of construction workers shall be as per the Indian Standard for Drinking Water IS: 10500, 1991.

OM – 5: SLOPE STABILITY AND EROSION CONTROL

1. INTRODUCTION

1. Stability of slopes is a major concern in locations of high embankment. In cases of high embankment, water retention at the embankment base initially causes toe failure and subsequently failure of the whole embankment. Soil erosion is consequent to high runoff on hill slopes. Embankments made up of silty and sandy soils get eroded, in the absence of vegetative cover, when the slopes are steep say more than 20 Degree.

2. The scope of this guideline includes measures to minimize the adverse environmental impacts due to slope instability and soil erosion. The adverse environmental impact can be: (i) Damage to adjacent land. (ii) Silting of ponds and lakes disturbing the aquatic habitat (iii) Erosion of rich and top fertile top layer of soil (iv) Contamination of surface water bodies and (v) Reduction in road formation width due to erosion of shoulders/berms.

2. PROJECT PLANNING AND DESIGN STAGE

3. During the detailed project preparation phase, the following investigations shall be carried out prior to finalisation of alignment.

- Topographical;
- Hydrological;
- Geo-technical; and
- Geological Investigation (in case of roads in hill areas and areas of high seismic activity)

4. In addition to the slope stability analysis the alignment should be such that (i) steep as well as heavy cuts are avoided, (ii) Flora and fauna of the area are not disturbed and (iii) Natural drainage pattern is not obstructed.

5. For high embankments, geo-technical investigations (determination of C, ϕ , density etc.) of the available material need to be done to check its suitability as fill material.

6. Following guidelines shall be followed in desert areas while using cohesion-less soils for embankment construction.

- The alignment should follow the natural ground level to the extent possible and the embankment shall be restricted to minimum to achieve ruling grades.
- Slope of the embankment should be 3 (H): 1(V) or flatter.
- The corners of the embankment should be rounded for better aerodynamic performance.

3. PRE-CONSTRUCTION STAGE

7. Interceptor ditches are constructed along hilly slopes or areas with high rainfall to protect the road bench and hillside slope from erosion due to heavy rainfall and runoff. Interceptor ditches are very effective in the areas of high intensity rainfall and where the slopes are exposed. These are the structures designed to intercept and carry surface run-off away from erodible areas and slopes, thus reducing the potential surface erosion. The Engineer-in-charge must ensure that the layout and siting of ditches is as per specifications.

4. CONSTRUCTION STAGE

8. When alternative material such as fly ash is used for embankment formation, it needs to be ensured that sufficient filter bed is provided along with the top cap. All tests as per IS: 2720 (Parts: 4, 5, 8 & 40) and IRC: SP: 20-2002 are to be conducted on the embankment to keep a check on the compaction achieved. Slope stabilisation techniques and erosion control measures such as vetiver grass, stone pitching, use of geotextile and turfing.

Preparation

The vegetation cover should be planted in the region where the soil has the capacity to support the plantation and will ensure a healthy ecological condition for future vegetation growth.

For Preparation

- To protect the soil from being washed away once plant is sowing, the area should be protected with plastic mulching and irrigation.
- Soil samples should be taken frequently to monitor soil fertility and lime requirements.

For Application

- The seed should be sown uniformly as soon as preparation of the seedbed has been completed.
- The seed should be sown during rainy weather. The best time for seeding would be during monsoon.

Aftercare

During the six weeks, the planting should be inspected by the EIC to check if the growth is uniform and dense. Appropriate moisture levels shall be maintained. There may be requirement of watering the plantings regularly during the dry season.

5. POST CONSTRUCTION STAGE

9. All the exposed slopes shall preferably be covered with vegetation using grasses, brushes etc. Locally available species possessing the properties of (i) good growth (ii) dense ground cover and (iii) deep root shall be used for stabilization.

10. In case of steep and barren slopes, in order to retain the seedling to the ground asphalt mulch treatment shall be given. Seedling are covered with asphalt emulsion and spread into a thin layer. The asphalt film gradually disintegrates and a carpet of green vegetation and deep-rooted species of grass and clovers, takes its place. Anchoring shall be carried out as per IRC: SP: 48-1998.

11. Regular inspection of check dams and repositioning/replacement of dislodged or stolen stones need to be carried out.

12. Repair and maintenance of eroded side drain inverts is to be done in order to arrest retrogradation of levels in side drains. Slopes of high embankment can give a fertile base for growth of vegetative cover / sodding.

13. In arid areas, in order to avoid the deposition of sand over or near the road surface, shrubs are to be planted at an appropriate distance from the formation. The shrubs should not be abutting the road and the distance for carrying out plantation shall be determined based on prevalent wind speeds as well as quantity of sand being carried amongst various other factors. There should be a clear gap between the roadway and shrubs to allow the wind to pick up its velocity and carry along with it any sand that is deposited.

OM – 6: WASTE MANAGEMENT AND DEBRIS DISPOSAL

1. INTRODUCTION

1. This guidance describes procedures for handling, reuse and disposal of waste materials during road construction. The Guideline describes waste management measures in all stages of construction. Also, the Guideline discusses the measures to be taken for debris disposal.

2. PROJECT PLANNING AND DESIGN STAGE

2. As part of DPR preparation, R&BD (Panchayat) shall carry out the following measures
- Finalize road design and alignment to minimize waste generation through balancing of cut and fill operations and minimizing excess cuts requiring disposal.
 - Identify the type of wastes as well as sources of waste during construction and suggest options for possible reuse
 - Provide guidelines to the contractor for locating waste disposal sites for non-toxic wastes
 - Identify existing landfill sites if available for disposal of toxic materials.
 - In case no existing landfill sites are available, identification of landfill site as well as identification of the clearance requirements.
 - Identify sites of disposal of debris.

3. PRE-CONSTRUCTION STAGE

3. The contractor shall identify the activities during construction, that have the potential to generate waste and work out measures for reducing, reusing and proper disposing of the generated waste in the construction schedule to be submitted to the Engineer-in-charge. A sequential listing of the activities during road construction and the nature of wastes together with the possible options for reuse are specified in **Table 6-1**. For the disposal of excess cut and unsuitable (non-toxic) materials, the contractor shall identify the location for disposal in consultation with the community / concerned department. Any toxic materials shall be disposed in existing landfill sites that comply with legislative requirements. Prior to disposal of wastes onto private/community land, it shall be the responsibility of the Contractor to obtain a No-objection Certificate (NOC) from the land owner/community. The NOC shall be submitted to the Engineer-in-charge prior to commencement of disposal.

4. The Contractor shall educate his workforce on issues related to disposal of waste, the location of disposal site as well as the specific requirement for the management of these sites.

4. CONSTRUCTION STAGE

5. The Contractor shall either reuse or dispose the waste generated during construction for roads depending upon the nature of waste, as specified in **Table 6-1**. The reuse of waste shall be carried out by the contractor only after carrying out the specific tests and ascertaining the quality of the waste materials used, and getting the same approved by the Engineer-in-charge. Wastes that were not reused shall be disposed off safely by the contractor. The contractor shall adopt the following precautions while disposing wastes:

- Bituminous wastes shall be disposed off in 60mm thick clay lined pits and covered with 30cm good earth at top, so as to facilitate growth of vegetation in long run.
- In case of filling of low-lying areas with wastes, it needs to be ensured that the level matches with the surrounding areas. In this case care should be taken that these low lying areas are not used for rainwater storage
- In case oil and grease are trapped for reuse in a lined pit, care shall be taken to ensure that the pit should be located at the lowest end of the site and away from the residential areas.

6. The waste management practices adopted by the Contractor, including the management of wastes at construction camps etc. shall be reviewed by the Engineer-in-charge and the Gujarat Pollution Control Board (GPCB) during the progress of construction.

Practices to avoid – waste disposal ...

- Tipping of waste into stream channels, water bodies, forests and vegetated slopes
- Non-cleaning of wastes after day's work
- Leaching of wastes
- Littering in construction camps / sites
- Storing wastes on private land

5. POST CONSTRUCTION STAGE

7. On decommissioning of construction sites, the Contractor shall hand over the site free of all debris/wastes to the satisfaction of R&BD (Panchayat). In case of any temporary disposal of wastes on private land, certificate of Completion of Reclamation is to be obtained by the Contractor from the landowner that "the land is restored to his satisfaction". The same is to be submitted to the Engineer-in-charge before final payment is claimed.

Table 6-1: Type of wastes and scope for reuse- road construction

S. No	Activity	Type of waste	Scope for possible reuse	Disposal of waste
I	CONSTRUCTION WASTES			
1.	Site Clearance and grubbing	Vegetative cover and top soil Unsuitable material embankment foundation	Vegetating embankment slopes in Embankment Fill	Low lying areas Land fill sites
2.	Earthworks			
a)	Overburden of borrow areas	Vegetative cover and soil	Vegetating embankment slopes	
b)	Overburden of quarries	Vegetative cover and soil Granular material	Vegetating embankment slopes Embankment Fill Picking	
c)	Accidental spillages during handling	Dust		
d)	Embankment construction	Soil and Granular Material	Embankment Fill	
e)	Construction of earthen drains	Soil	Embankment Fill	
3.	Concrete structures Dust			
a)	Storage of material	Dust, Cement, Sand Metal Scrap	Constructing temporary structure, embankment fill	Scrap Yard
b)	Handling of materials	Dust		
c)	Residual wastes	Organic matter Cement, sand Metal scrap	Manure, Revegetation Constructing temporary structure, embankment fill Diversion sign, Guard Rail	
4	Reconstruction works			
a)	Dismantling of existing pavement	Bitumen Mix, granular material Concrete Guard rail sign post, guard stone	sub-base Road Sub-base, reuse in concrete, fill material and as rip rap on roads Reuse for same	
b)	Dismantling of cross-drainage structures	Granular material & bricks Metal scrap Pipes	Constructing temporary structure, embankment fill Diversion sign, Guard Rail Culvert Culvert	
5	Decommissioning of sites			
a)	Dismantling of temporary structures	Granular material and bricks	Constructing temporary structure, embankment fill	
6	Maintenance operation			
a)	Desilting of side drains	Organic matter and soil	Revegetation	
II	OIL AND FLUIDS			
1	Construction machinery maintenance and refueling	Oil and Grease	Incineration, Cooking, Illumination	
2	Bituminous works			
a)	Storage	Bitumen	Low Grade Bitumen Mix	
b)	Mixing and handling	Bitumen Bitumen Mix	Low Grade Bitumen Mix Sub-base, Paving access & cross roads	
c)	Rejected bituminous mix	Bitumen Mix	Sub-base, Paving access & cross roads	
III	DOMESTIC WASTES			
1	Construction camps	Organic waste, Plastic and metal scrap Domestic effluent	Manure Irrigation	Scrap Yard

6. Disposal of Debris

8. For the purpose of disposal of debris, dumping sites need to be selected. The criteria for selection of dumping sites include:

- No residential areas are located downwind side of these locations;
- Dumping sites are located at least 1000 m away from sensitive locations;
- Dumping sites do not contaminate any water sources, rivers etc; and
- Dumping sites have adequate capacity equal to the amount of debris generated;
- Public perception about the location of debris disposal site has to be obtained before finalizing the location;
- Permission from the Village Panchayat is to be obtained for the dumping site selected;
- Productive lands are avoided; and
- Available waste lands shall be given preference

OM – 7: CONSTRUCTION PLANTS & EQUIPMENT MANAGEMENT

1. GENERAL

1. During execution of the project, construction equipment's, machinery and plants are likely to cause adverse impact on the environment. The impact can be due to the emissions, dust, noise and oil spills that concern the safety and health of the workers, surrounding settlements and environment as a whole. This guideline describes the activities during the project stages where pollution control measures are required.

2. PROJECT PLANNING AND DESIGN STAGE

2. Selection criteria for setting up a plant area and parking lot for equipment's and vehicles shall be done as per siting criteria for construction camp specified in Guideline on "Construction and Labour Camps".

3. PRE-CONSTRUCTION STAGE

3. The Contractor must educate the workers to undertake safety precaution while working at the plant / site as well as around heavy equipment's. Before setting up the crusher, hot-mix plant and generator, the Contractor shall acquire "No Objection Certificate (NOC)" from the Gujarat State Pollution Control Board for the same. The Contractor shall ensure all vehicles must possess Pollution under Control (PUC) Certificate, which and shall be renewed regularly. The Contractor must ensure that all machinery, equipment's, and vehicles shall comply with the existing Central Pollution Control Board (CPCB) noise and emission norms. The Engineer-in-charge must ensure that the Contractor shall submit a copy of the NOC and PUC Certificates before the start of work. The Contractor shall design the service road with protection measures as black topping at vulnerable points as in low lying areas.

4. CONSTRUCTION STAGE

4. The Contractor shall undertake measures as per **Table 7-1** to minimize -the dust generation, emissions, noise, oil spills, residual waste and accidents at the plant site as well as during transportation of material to construction site.

Table 7-1: Measures at Plant Site

Concern	Causes	Measures
Dust Generation	Vehicle Movement	<ul style="list-style-type: none"> • Water sprinkling • Fine Materials shall be Transported in Bags or Covered by Tarpaulin during Transportation • Tail board shall be properly closed and sealed to be spill proof
	Crushers	<ul style="list-style-type: none"> • Regular Water Sprinkling to keep the dust below visibility level
	Concrete-Mix Plant	<ul style="list-style-type: none"> • Educate the workers to follow/adopt good engineering practices while material handling
Emissions	Hot-Mix Plant	<ul style="list-style-type: none"> • Site Selection as per Clause 6.5.2, Section 6.5, IRC's Manual for Construction & Supervision of Bitumen Work • Regular maintenance of Dust Collector as per manufacture's recommendations
	Vehicles	<ul style="list-style-type: none"> • Regular maintenance as per manufacture's recommendation
	Generators	<ul style="list-style-type: none"> • Exhaust vent of long length and emission to confirm to PCB norms.
	Heavy Load Vehicles	<ul style="list-style-type: none"> • Exhaust silencer, Regular maintenance as per manufacture schedule
Noise	Crushers	<ul style="list-style-type: none"> • Siting as per guideline, "Construction and Labour Camps"
	Generators	<ul style="list-style-type: none"> • All generators should have mandatorily acoustic enclosures and confirms to PCB norms.
Oil Spills	Storage and Handling	<ul style="list-style-type: none"> • Good practice, guideline, "Waste Management and Debris Disposal"
Residual waste	Dust Collector and Pits	<ul style="list-style-type: none"> • Guideline, "Waste Management and Debris Disposal"
Concrete waste	Concrete-Mix plant	<ul style="list-style-type: none"> • Guideline, "Waste Management and Debris Disposal"
Bitumen and bitumen mix	Hot-mix Plant	<ul style="list-style-type: none"> • Guideline, "Waste Management and Debris Disposal"
Safety	Stone chips	<ul style="list-style-type: none"> • Guideline, "Waste Management and Debris Disposal"
	Crushers	<ul style="list-style-type: none"> • Guideline, "Waste Management and Debris Disposal"
	Trajectory of Equipment's	<ul style="list-style-type: none"> • No worker shall be present in the vicinity of the equipment's
	Movable Parts of Equipment's	<ul style="list-style-type: none"> • Caution Sign, awareness among workers
	Plant Area / Site	<ul style="list-style-type: none"> • Caution Sign, Safety Equipment's
	Accidents / Health	<ul style="list-style-type: none"> • First Aid Box, Periodic Medical Checkup Break down of Break down of vehicles • Arrangement for towing and bringing it to the workshop

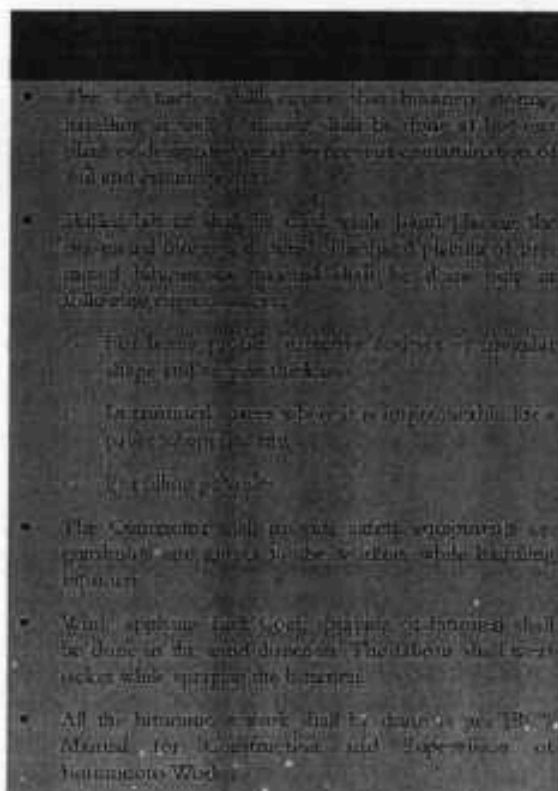
5. During site clearance, all cut and grubbed materials shall be kept at a secured location so that it does not raise any safety concerns. During excavation, water sprinkling shall be done to minimize dust generation. Frequent water sprinkling shall be done on the haul roads to minimize dust generation. In case of loose soils, compaction shall be done prior to water sprinkling. Cautionary and informatory sign shall be provided at all locations specifying the type of operation in progress. The contractor must ensure that there is minimum generation of dust and waste while unloading the materials from trucks. The construction waste generated shall be disposed as per Guideline on, "Waste Management and Debris Disposal". The equipment's, which are required to move forward and backward, shall be equipped with alarm for backward movement. It shall be ensure that the workers shall remain away from the working areas at such times. Also, equipment's at construction camp should be barricaded and kept away from residential quarters of workers.

6. The Engineer-in-charge shall carry out periodic inspections to ensure that all the pollution control systems are appropriately installed and comply with existing emission and noise norms.

5. POST-CONSTRUCTION STAGE

7. The Engineer-in-charge shall ensure that all the haul roads are restored to their original state. In case any inner village road is damaged while transporting the procured material; the contractor shall restore the road to its original condition. The Engineer-in-charge must ensure that the decommissioning of plant shall be done in environmentally sound fashion and the area to bring its original state.

8. Designated area refers to paved surfaces and barren parcels of land, with adequate drainage and disposal system. It must be ensure that these are away from agriculture land, water body and other sensitive areas.



- The Contractor shall ensure that whenever entry, including on-site, is made, shall be done at least one hour before the start of work to allow for containment of dust and ensure safety.
- While taking up the work, while doing the work, the Contractor shall ensure that the following measures shall be taken up at following stages:
 - First being proper warning devices – directional signs and cones on trucks.
 - In transport, once when it is impossible to be taken off the road.
 - Calling a stop.
- The Contractor shall ensure that whenever a vehicle is used, it shall be a vehicle which is not a motor vehicle.
- While working, the Contractor shall ensure that the work shall be done in the area where the Contractor shall be working while working the material.
- All the human work shall be done in the "B" Manual for Construction and Operation of Human Work.

OM – 8: LABOUR AND WORKER'S HEALTH AND SAFETY

1. INTRODUCTION

1. The safety and health concerns of the workers and the community are impacted due to the hazards created during the construction of road. **Box: 1** gives the safety concerns during construction. This Guideline describes the hazards and measures that need to be taken to mitigate the impacts.

2. PROJECT PLANNING AND DESIGN STAGE

2. To address health and safety concerns, the DPR shall contain selection criteria for setting up:

- Construction Camps (as per guideline);
- Borrow Areas (as per guideline); and
- In case of opening new quarry areas (as per guideline).

3. To address the safety concerns to road user during operational phase, the DPR shall contain the following:

- Selection and location of regulatory as well as informatory signs as per IRC: 67-2001, depending upon the geometry of the road.

PRE-CONSTRUCTION STAGE

4. In order to incorporate public health and safety concerns, the Engineer-in-charge and the Contractor shall disseminate the following information to the community:

- Location of construction camps, borrow areas and new quarry areas;
- Extent of work;
- Time of construction;
- Diversions, if any;
- Precaution measures in sensitive areas;
- Involvement of local labours in the road construction;
- Health issues - water stagnation, exposure to dust, communicable disease; and
- Mechanism for grievances.

3. CONSTRUCTION STAGE

5. During the progress of work, following are the safety requirements that need to be undertaken by the contractor at the construction site:

- Personal Protective Equipment's (PPE) for the workers. **Table 8-1** gives the safety gear to be used by the workers during each of the construction activities.
- All measures as per bidding document shall be strictly followed.
- Additional provisions need to be undertaken for safety at site:
- Adequate lighting arrangement;
- Adequate drainage system to avoid any stagnation of water;
- Lined surface with slope 1:40 (V:H) and provision of lined pit at the bottom, at the storage and handling area of bitumen and oil, as well as at the location of generator (grease trap); and
- Facilities for administering first aid.

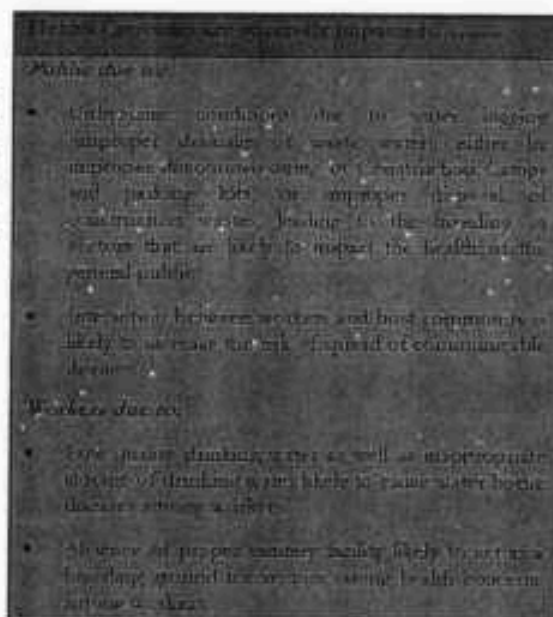


Table 8-1: Worker Safety Measures

Sl. no.	Activity	Safety Requirement
1.	Setting out and levelling	<ul style="list-style-type: none"> • Luminous jackets; • Helmets; • Boots for protection against insect bite, and Dust Mask
2.	Tree cutting	<ul style="list-style-type: none"> • Helmet Boots • Luminous safety jackets
3.	Reinforced yard/ carpentry/ reinforcement cutting/ bending work	<ul style="list-style-type: none"> • Hand gloves
4.	Shuttering work	<ul style="list-style-type: none"> • Goggles Hand gloves • Hand gloves
5.	Plant and Machinery	<ul style="list-style-type: none"> • Boots • Helmets • Dust Mask
6.	Material handling	<ul style="list-style-type: none"> • Hand gloves • Dust mask
7.	Batching plant	<ul style="list-style-type: none"> • Goggles • Hand gloves • Dust mask
8.	Weeding	<ul style="list-style-type: none"> • Goggles
9.	Binding reinforcement	<ul style="list-style-type: none"> • Safety belt • Boots
10.	Manual concrete laying	<ul style="list-style-type: none"> • Gum boots • Hand gloves • Helmet
11.	Piling	<ul style="list-style-type: none"> • Helmet • Hand gloves, gumboots

6. The following measures need to be adopted by the contractor to address public safety concerns:

- The Contractor shall schedule the construction activities taking into consideration factors such as:
 - Sowing of crops;
 - Harvesting;
 - Local hindrances such as festivals etc.; and
 - Availability of labour during particular periods.
- All the cautionary signs as per IRC: 67-2001 and traffic control devices (such as barricades, etc) shall be placed as soon as construction activity get started and shall remain in place till the activities get completed.
- Following case specific measures need to be followed during the progress of the activity:
 - In case of blasting, the Contractor must follow The Explosives Rules, 1983.
 - In case of construction activity adjoining the water bodies, measures shall be taken as per measures suggested in Guideline on "Water Body".
 - If construction of road is within the settlement, the contractor must ensure that there shall not be any unauthorized parking as well as storage of material, adjacent to road.
 - Approved chemicals should be sprayed to prevent breeding of mosquitoes and other disease-causing organisms, at all the water logging areas.

7. The Engineer-in-charge shall carry out periodic inspections in order to ensure that all the measures are being undertaken as per the guideline.

4. POST-CONSTRUCTION STAGE

8. During this stage a major concern is on road user safety. Following are the measures that need to be undertaken by the Engineer-in-charge to ensure safer roads:

- Inspection and maintenance of installed regulatory and informatory signs.
- Ensure that the location of signage does not obstruct the visibility
- In case of hill roads, maintenance of parapet wall as well as of overtaking zones.

9. The Engineer-in-charge must ensure that during the maintenance operation of road, road materials are stored at a location such that they shall not create any risk to road users.

10. The construction site shall be cleaned of all debris, scrap materials and machinery on completion of construction for the safety of public and road users, as per the measures given in Guideline on "Construction and labour Camp" and "Waste Management and Debris Disposal."

OM – 9: FORESTS AND OTHER NATURAL HABITATS

1. INTRODUCTION

1. This guideline envisages measures to be undertaken during blacktopping / widening of road sections passing through natural habitats. These measures shall be undertaken in addition to the measures laid down in the other Guidelines.

2. Conservation of natural habitats is essential for long-term sustainable development. A precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development has been adopted for the project.

Natural Habitats include:
• National Park
• Reserve Forest
• Sanctuaries
• Notified Wetlands
• Pribbenes and Aquatic Habitats

2. PROJECT PLANNING AND DESIGN

3. To minimize the adverse impact on the ecology of the natural habitats, selection of alignment should be as per guideline. An officer of at least the rank of a forest ranger shall be deputed for detailed inventory of ecological features along the road. The nature and type of impact on natural habitats due to road construction shall be identified. Magnitude of the impact to the extent feasible on the ecological features shall also be assessed.

Ecological Features	Adverse Impacts
• Area of natural habitat	• Diversion of forest land
• Type and number of indigenous species of flora and fauna	• Cutting of trees
• Burrows and water bodies	• Trampling of vegetation
• Breeding ground and roosting	• Contamination of water due to the entry of water from the source within the natural habitat
• Migration routes of birds, fishes and	• Loss of breeding grounds and
• Animal breeding	• Interference to natural movement through the construction

4. Impacts identified on the natural habitats shall be minimized to the extent required. Minimization shall be through precautionary measures or through appropriate mitigation measures. Following are the measures should be undertaken along the road passing through natural habitats:

- Constricting the road width to 6.0 m and embankment height to 0.5 m to minimize the extent of diversion of forest land and cutting of trees
- Drainage Structures shall be designed strictly in accordance with guideline on "Drainage".
- Rumble strips shall be provided at every kilometer along the length of the natural habitat and invariably at the start and end of the natural habitat
- Signage (viz. speed limit, animal crossing, switch of headlight etc) shall be provided as per IRC: 67-2001 Code of Practice for road sign (first revision)

5. In addition to the above measures, specific impacts identified on site shall be mitigated as per the recommendation of the forest department / officer in charge of the identified natural habitat.

6. In case proposed alignment falls within the catchments of a water body or a stream, a flush causeway shall be constructed without impacting the drainage system. The length of the causeway shall be as per the existing water spread. The causeway shall be strictly in compliance with IRC:SP-20:2002. In no circumstances a water body within the natural habitat shall be cut across or filled for the purpose of laying the road.

3. PRE-CONSTRUCTION STAGE

7. No Construction Camps, Stockyards, Concrete Batching or Hot Mix Plants shall be located within the natural habitat or within 500m from its boundary.
8. Contractor in consultation with forest ranger or any other concerned authority shall prepare a schedule of construction within the natural habitat. Due consideration shall be given to the time of migration, time of crossing, breeding habits and any other special phenomena taking place in the area for the concerned flora or fauna.

4. CONSTRUCTION STAGE

9. Procurement of any kind of construction material (as quarry or borrow material) from within the natural habitat shall be strictly prohibited. No water resources within the natural habitat shall be tapped for road construction. Use of mechanized equipment shall be kept minimum within the natural habitat. Contractor must ensure that there will be no parking of vehicles machine and equipment within the natural habitat. Disposal of construction waste within the natural habitat shall be strictly prohibited and as far as possible reuse shall be undertaken as per **Table 6-1** type of waste of guideline, "Waste Management and Debris Disposal".

5. POST CONSTRUCTION STAGE

10. The road passing through the natural habitat shall be declared as a silence zone. Compensatory tree plantation within the available Right of Way shall be done in accordance with guideline, on "Tree Cutting and Afforestation".

ANNEXURE - 2: No Objection Certificate Water Resource

(WATER RESOURCE)

No Objection Certificate

This is to certify that the Gram Sabha has no objection to the use of the available water resources like boring, wells, ponds etc. falling in the village of
..... of the development block /
revenue circle of the
district..... for the construction of the proposed road
..... under the
MMGSY.

Signature (Gram Pradhan)

..... Gram Panchayat

ANNEXURE - 3: Environmental Monitoring Formats

Format EM1: Selection of disposal site locations

From _____ To _____

(Give chainage and nearest settlements from both ends)

Criteria on which information for each site is to be collected	Site 1	Site 2	Site 3	Site 4
Area covered (m ²)				
Total Material that can be dumped within the site (m ³)				
Depth to which disposal is feasible (m)				
Distance of nearest watercourse (m)				
Nearest Settlement (m)				
Date/s of Community Consultation/s				
Whether the community is agreeable to siting of dumping site (Y/N)				
Date of Permission from Village Council President(VCP)				
Proposed future use of the Site				

Selected Site (tick any one column only)

Certified that the above information is correct to the best of my knowledge and belief.

Contractor

Signed:

Date:

Name & Designation:

Recommendation on the suitability of the site

Decision Taken (tick one):

Approved/Not Approved

PMC

Signed:

Date:

Name and Designation of Deciding Authority

Enclosures

(Tick as appropriate)

- 1 Maps of each location
- 2 Photographs
- a Each disposal location
- b Each community consultation
- 3 Photocopies of permissions from VCPs

Format EM2: Construction Camp and Storage Area

Construction Stage: Report - Date _____ Month _____ Year _____

(Site Layout of Construction camp and working drawings of dwelling units with allied facilities to be attached with format)
Format to be submitted before target date (decided by R&BD, Panchayat) of establishing camps

Location of Camp (km _____)

Sl. No	Item	Unit	Details	Remarks
1	Detail of item camp			
A	Size of Camp	Mxm		
B	Area of Camp	sq.m		
C	Distance from Nearest Settlement			
D	Distance from Nearest Water Source	Type/Size/Capacity/Present Use/Ownership		
E	Date of camp being operational dd/mm/yy			
F	Present land use			
G	No other trees with girth > 0.3m			
H	Details of Storage area(Availability of impervious surface)	m x m		
I	Availability of separate waste disposal from storage area	Cum		
2	Details of top soil stacking			
A	Quantity of top soil removed	Cum		
B	Detail of storage of topsoil	Describe stacking arrangement		
3	Details of workforce			
A	Total No of Labourers	nos		
B	Total no of Male Workers	nos		
C	No of Male Workers below 18 years of age	nos		
D	Total No of Female Workers	nos		
E	No of Female workers below 18 years of age	nos		
F	No of children	nos		
4	Details of dwelling units			
A	No of dwellings/huts	nos		
B	Minimum Size of Dwelling	m x m		
C	No of openings per dwelling	nos		
D	Minimum size of opening	m x m		
E	Walls	specifications		
F	Roofing	specifications		
G	Flooring	specifications		
H	Drinking Water Tank	specifications		
I	Capacity of Drinking water Tank	cum		
J	Size of Drinking Water Tank	m x m x m		
K	Total no of WC	nos		
L	No of Wcs for female workers	nos		
M	Minimum Size of WC	m x m		
N	Total No of Bathrooms for female workers	nos		
O	Size of septic tank for WC/Baths	m x m x m		
P	Capacity of Water Tank for WCs/ Bathrooms and general purpose			
Q	Fencing around camp	Y/N		
5	Details of facilities			
A	Availability of security guard 24 hrs a day	Yes/No		
B	Details of First Aid Facility	Yes/No		
C	Availability of Day Care Centre	Yes/No		
D	Availability of dust bins (capacity 60 ltr)	nos		

Certified that the furnished information is correct the quality of work is as per god practice and all relevant information as required is attached

Contractor

Engineer-In-Charge

Format EM3: Reporting for Borrow Areas

Construction Stage Report: Date _____ Month _____ Year _____ Site Layout of Borrow Area and Proposed Borrow Area Redevelopment Plan to be attached with format. Format to be submitted before target date as (decided by R&BD, Panchayat) for establishing Borrow Areas Borrow Area No. BA _____ Location of Borrow Area (Km _____)

Sl. No	Item	Unit	Details	Remarks, if any
1	Details of Borrow Area			
A	Date of Borrow Area becoming operational dd/mm/yy			
B	Current Land use			
C	Distance from Nearest Settlement	Km		
D	No of settlements within 200m of Haul Road	No.		
E	No of settlements within 500m of Borrow Area	No.		
F	Total Capacity	cum		
G	No of Trees with girth more than 0.3 m	No.		
H	Length of Haul Road	km		
I	Width of Haul road	m		
J	Type of Haul Road	metal/dirt		
K	Size of Borrow Area	Sq. km.		
L	Area of Borrow Area	km x km		
M	Quantity Available	cum		
N	Distance of Nearest Water Source	Type/Size/Capacity/Present Use/Ownership		
O	Quantity of top soil removed	cum		
P	Detail of storage of topsoil			
Q	Daily/occasional use of the Borrow Area by the community, if any	-		
R	Probable reuse of Borrow pit-ask community	-		
S	Drainage channels/slope/characteristics of the area	-		
2	Enhancement Elements			
A	Quantity of top soil removed	sq.m		
B	Detail of storage of topsoil	sq.m		
C	Adjoining land use/Natural elements			
D	Near by catchment for storing water			
E	Erosion Control Programme			
F	Preventive measures for			
i	Leaching			
ii	Mosquito Breeding			
iii	Water run-off/contamination			
iv	Any other environmental degradation			
3	Details of workforce			
A	Total No of Labourers	No.		
B	Total no of Male Workers	No.		
C	No of Male Workers below 18 years of age	No.		
D	Total No of Female Workers	No.		
E	No of Female workers below 18 years of age	No.		
4	Details of redevelopment, Plan to be enclosed			

Certified that the furnished information is correct the quality of work is as per good practice and all relevant information as required is attached

Contractor

Engineer-In-Charge

Format EM4: Tree Felling

Sr. No.	Links	Physical Target				Completion Target		Reason for Delay if any
		Total	Target	Target Achieved	% of task completed	Target Date	Date of Completion if task completed	
		Unit						
1		nos						
2		nos						
3		nos						
4		nos						

Contractor

Engineer-In-Charge

Format EM 5 Topsoil Conservation Monitoring

Contract _____

Report No. _____

Date _____

Location (Chainage)	Original Use of Topsoil removed	Measures for preventing spillage of topsoil on Haul Roads(Earthe n/ Metalled)	Present Method of Storage	Anticipated period of Storage (Months)	Distance of nearest Water course (m)	Present Slope of Pile (V: H)	Whether silt fencing provided ?	Is any other covering/ measure provided ? If yes, what is it?	Improvement is required	Extent of Compliance as on date of report

Certified that the above is true.

Signed _____

Contractor

Verified _____

Signed _____

Engineer-In-Charge

Format EM 6 Redevelopment of Borrow Areas

Operation Stage: Report Date ____ Month ____ Year ____

To be monitored by R&BD, Panchayat during operation period

Details of remarks to be appended wherever necessary.

Sl. No	Activity	Particulars	Drawbacks Identified			Improvements Required		
			Construction	Financial	Others (Ask Community)	Technical	Financial	Remarks/ Suggestions
1	Details of Borrow area and Surrounding Landuse							
2	End use of the borrow area							
3	Whether rehabilitation has been carried out in line with owners request							
4	Erosion Control Measures							
5	Number of trees planted							
6	Reuse of topsoil							
7	Preventive measures taken for -Mosquito Breeding -Water runoff/ contamination -Other Environmental Degradation							
8	Any problems faced by owner							
9	Any problems faced by the local community							
10	If it has been developed as a fish pond.							
a	Details of available catchment for storing water							
b	Economic Benefits/Utility							
11	If it has been developed as an orchard							
a	Details of suitability of soil and water.							
B	Type of Plantation							
c	Economic Benefits/Utility							
12	Any Other End use							
a	Particulars							
b	Economic Benefits/Utility							

Contractor

Engineer-In-Charge

Format EM 7 Checklist for Construction Safety

SL No.	Safety Issues	Yes	No	Non compliance	Corrective Action	Penalty	Remarks
Safety during Construction Stage							
1	Appointment of qualified Construction safety officers (there should be provision in the conditions of the contract regarding appointment of qualified construction safety engineer to look after environmental aspects)						
2	Approval for Construction Safety Management Plan by the Engineer-in charge.						
3	Approval for Traffic Management/control Plan in accordance with IRC: SP: 55-2001						
4	Maintenance of the existing road stretches handed over to the Contractor.						
5	Provision of Temporary Traffic Barriers/Barricades/caution tapes in construction zones						
6	Provision of traffic sign boards						
7	Provision for flags and warning lights						
8	Provision of metal drum/empty bitumen drum delineator, painted in circumferential strips of alternate black and white 100mm wide 2 coats fitted with reflectors 3 Nos of 7.5cm diameter						
9	Providing plastic crash barrier						
10	Provision of adequate staging, form work and access (ladders with handrail) for works at a height of more than 3.0 m						
11	Provision of adequate shoring / bracing / barricading / lighting for all deep excavations of more than 3.0 m depth.						
12	Demarcations (fencing, guarding and watching) at construction sites						
13	Provision for sufficient lighting especially for night time work						
14	Arrangements for controlled access and entry to Construction zones						
15	Safety arrangements for Road users / Pedestrians						
16	Arrangements for detouring traffic to alternate facilities						
17	Regular Inspection of Work Zone Traffic Control Devices by authorized contractor personnel						
18	Construction Workers safety - Provision of personnel protective equipment						
19	A. Helmets						
	B. Safety Shoe						
	C. Dust masks						
	D. Hand Gloves						
	E. Safety Belts						
	F. Reflective Jackets						
	G. Earplugs for labour						

Sl. No.	Safety Issues	Yes	No	Non compliance	Corrective Action	Penalty	Remarks
20	Workers employed on bituminous works, stone crushers, concrete batching plants etc. provided with protective goggles, gloves, gumboots etc.						
21	Workers engaged in welding work shall be provided with welder protective shields						
22	All vehicles are provided with reverse horns.						
23	All scaffolds, ladders and other safety devices shall be maintained in as safe and sound condition						
24	Regular healthcheck-up for labour/ Contractor's personnel						
25	Ensuring the sanitary conditions and all waste disposal procedures & methods in the camps.						
26	The Contractor shall provide adequate circuit for traffic flow around construction areas, control speed of construction vehicles through road safety and training of drivers, provide adequate signage, barriers and flag persons for traffic control						
27	Provision for insurance coverage to the contractor's personnel						

Contractor

Engineer-In-Charge

Format EC1: Target Sheet for Pollution Monitoring

Construction Stage: Report - _____ Date _____ Month _____ Year _____

(Locations at which monitoring to be conducted as per EMP)

Sl. No	Chainage	Details of Location	Duration of Monitoring	Instruments Used	Completion Target		Reason for Delay if any
					Target Date	Date of Completion if task completed	
Air Monitoring							
1							
2							
3							
4							
5							
Water Monitoring							
1							
2							
3							
4							
5							
Noise Monitoring							
1							
2							
3							
4							
5							

Certified that the Pollution Monitoring has been conducted at all the locations specified in the EMP

Contractor

Engineer-In-Charge

Reporting System

The contractor will operate the reporting system for environmental condition and environmental management indicators. The Contractor will report to the Executive Engineer (Panchayat Division) Roads and Building Department, Govt. of Gujarat on the progress of the implementation of environmental conditions and management measures as per the EMP. The reporting formats; environmental monitoring formats are enclosed in the **Annexure 3** and the summary of reporting is given in the **Table 4**.

Table 4: Summary details of Reporting

Format No.	Item	Stage	Contractor	EE (Panchayat), R & BD., GoG
			Implementation & Reporting to EE, (P), R & Bd., GoG	Oversee / Field Compliance Monitoring
EM 1	Identification of Disposal Locations	Pre-Construction, Construction	One Time	One Time
EM 2	Setting up of Construction Camp	Pre-Construction	One Time	One Time
EM 3	Borrow Area Identification	Pre-Construction	One Time	One Time
EM 4	Top Soil Monitoring	Construction	Quarterly	Quarterly
EM 5	Status Regarding Rehabilitation of Borrow Areas	Construction	-	Half Yearly
EM6	Construction Safety	Construction	Quarterly	Quarterly
EC 1	Pollution Monitoring	Pre-Construction, Construction	As Per Monitoring Plan	Quarterly
		Post Construction (DLP)		
		End of Maintenance		

Clearance Requirements of Government of Gujarat

Sr. No.	Clearances	Acts	Approving Agency	Applicability to the Project	Time Required	Responsibility	
						Execution	Monitoring (Supervision)
PROJECT IMPLEMENTATION STAGE							
1	Permission for Withdrawal of Surface Water from Rivers, Nala, Water harvesting structure/ Reservoirs/ Ponds/ Irrigation canals	Gujarat Water Supply and Sewerage Board Act, 1978	Gujarat Water Supply and Sewerage Board	Applicable (If the contractor is extracting surface water)	3 months	Contractor	Engineer-in-charge
2	Permission for Sand Mining from river bed	Mines and Minerals (Development and Regulation) Act, 1957	Commissioner of geology and mining, GoG	Applicable	2 month	Contractor	Engineer-in-charge
3	Permission For Opening of New Quarry	Mines and Minerals (Development and Regulation) Act, 1957	Commissioner of geology and mining, GoG	Applicable	2 month	Contractor	Engineer-in-charge
4	Hot mix plant, Crushers, Cement Batching Plant	Air (Prevention and Control of Pollution) Act, 1981	Gujarat Pollution Control Board	Applicable	3 months	Contractor	Engineer-in-charge
5	Storage of Hazardous Chemicals	Hazardous Waste (Management and Handling) Rules 1989 and Manufacturing Storage and Import of Hazardous Chemicals Rules 1989	Gujarat Pollution Control Board	Applicable	3 months	Contractor	Engineer-in-charge
6	Disposal of Hazardous Waste	Hazardous Waste (Management and Handling) Rules 1989	Gujarat Pollution Control Board	Applicable	2 months	Contractor	Engineer-in-charge
7	Disposal of Construction Waste and liquid effluent from Labour camps	Water (Prevention and Control of Pollution) Act 1974	Gujarat Pollution Control Board	Applicable	2 months	Contractor	Engineer-in-charge
8	Pollution Under Control Certificate	Central Motor Vehicles Act 1988	Transport Department (GoG)	Applicable	1 Month	Contractor	Engineer-in-charge
9	Employing Labour	Executing Agency of Building and other construction act, 1996	Labour & Employment Department, GoG	Applicable	1 Week	Contractor	Engineer-in-charge
10	Registration of Workers	Labour welfare Acts	Labour & Employment Department, GoG	Applicable	1 Month	Contractor	Engineer-in-charge

A K Patel
CEO, GSRRDA
079- 23256877-79
Fax: 079-23256878

Gujarat State Rural Roads Development Agency
(an agency of Roads & Buildings Department)
2nd floor, Nirman bhavan, Sector-10A, Gandhinagar
Email : gj-itno@nic.in

\No./SECON/MMGSY/ /2017

Date:20/09/2017

To,

Superintending Engineer

R&B (Panchayat)circle

Ahmedabad/Gandhinagar/

Rajkot-1/Rajkot-2/

Vadodara/Surat.

Sub:- "Inclusion of special conditions of contract" regarding implementation of ESMF mitigation measures.

You are well aware that MMGSY project is now financially assisted by AIIB in the form of Loan worth \$ 329 mill. Loan agreement is already signed on 4th August 2017, with AIIB. Under this there is an obligatory requirement of AIIB to study ESIA, TPPF and ESMF and to implement the mitigation measures in ongoing MMGSY project.

In view of above, a special condition of contract has been framed in consultation with AIIB authority, which is attached here with . It is directed to include this special condition along with SMART operational manual in invariably the tender document which are to be processed for the procurement after 4th August 2017.It is also to be noted that no separate. BOQ/extra item shall be made against implementation of this special condition, and same shall be specifically mentioned in the tender conditions. Moreover, for the tenders, which are already processed after 4th Aug 2017, suitable corrigendum/ Addition shall be issued for inclusion of this special conditions.

Actions taken for above, shall be intimated to this office.

Encl : "Special Condition and SMART operational manual

CE(P) & AS

Gandhinagar

CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS
ROADS IN MORBI DISTRICT - PACKAGE -2

PART-II
DOCUMENTS NOT TO BE ISSUED TO CONTRACTOR
INDEX

SR NO	DETAILS OF DOCUMENTS	PAGE NO.
1	Proforma-A	
2	Certificate Issued by A.A.E. of sub division,Dy. Ex. Engineer, and Executive Engineer.	
3	Put to and Not put to Amount Details.	
4	Quantity Sheet	
5	Schedule-B	
6	Asphalt Requirement Statement.	
7	Cement Requirement Statement.	
8	P.O.L	

CHEQUE LIST FOR DTP

Sr. No	Details	Clause No.	Page No.	Name of work	JOB No Date	Amount in Lakh.
1	Principle Approval Date and Amount (Attach letter)	-		CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN MORBI DISTRICT - PACKAGE -2		
2	Administrative Approval Date and Amount (Attach letter)	-		Attached herewith		
3	Technical Approval Date and Amount (Attach letter)	-		Name of work	Date of T.S	Amount in Lakh.
				CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN MORBI DISTRICT - PACKAGE -2		
4	SOR Year	-		2024-2025		
5	DTP amount	IFB		74613217.41		
6	Tender Fee Rs. (As per GR- PRCH-102000-1B221(59)-C, dated 24/01/2007) (1.0 Cr. To 3.0Cr.- Rs.3600/- 3.0 Cr. to 5.0 Cr. - Rs 6000 5.0 Cr. to 10.0 Cr. - Rs 12000 Above 10.0 Cr.- Rs 18000)	-		12000/-		
7	Earnest Money Deposit (Bid Security-1% of DTP amount) Rs.	IFB point 6		747000/-		
8	Time Limit (Months)	Section 3 cl. 17		10 Months		
9	Annual Financial Turnover Amount Rs.	Section 1 cl. 4.5.3(a)		Not Applicable		
10	Defect Liability Period (In Months & includes no. of Monsoons)	Section 3 cl. 33.1		12 Months		
11	Free Maintenance Guarantee Period (for Road & Bridge Construction)	Section 3 cl. 33.2		Five Year		
12	Registration/Category required	-		AA Class and above with Special Category-I (Bridge)		
13	Site Possession Date	Section 3 cl. 21		1st day of Work order#		

14	Period between Program Update (Days)	Section 3 cl. 27.3		30 days		
15	Amount to be withheld for late submission of Program	Section 3 cl. 27.3		1 Lakh		
16	Milestone: -	Section 3 cl. 49.1		%	Days	
A	Milestone 1			10	30	
B	Milestone 2			40	120	
C	Milestone 3			80	240	
D	Milestone 4			100	300	
17	Price Adjustment Components	Section 4 cl. 24		%	Input index/price*	
A	Labour, Pl	Section 4 cl. 24 (i)	Pl	18.67	Lo=	
B	Cement, Pc	Section 4 cl. 24 (ii)	Pc	17.81	Co	
C	Steel, Ps	Section 4 cl. 24 (iii)	Ps	26.07	So	
D	Bitument, Pb	Section 4 cl. 24 (iv)	Pb	0.00	Bo	
E	POL, Pf	Section 4 cl. 24 (v)	Pf	2.97	Fo	
F	Plant and Machinery Spares Pp	Section 4 cl. 24 (vi)	Pp	28.01	Po	
G	Other Materials, Pm	Section 4 cl. 24 (vii)	Pm	6.47	Mo	
	Total			100.00		
18	Amount to be withheld for failing to supply "as built" drawings	Section 3 cl. 58		5 Lakhs		
19	Percentage Rate Contract (upto INR 50 Cr.)/ Item Rate Contract (above INR 50 Cr.)	Section 7		Percentage Rate		

This is to certify that the contract document prepared for the work

#REP!

is based on the Standard Bidding Document Procurement of Civil Works published by R&B department letter No. RBD/0346/10/2023 dated 12/10/2023. No further modification and alteration in this standard format has been made by this office.

Deputy Executive Engineer
Panchayat R&B Sub Division
Morbi

Executive Engineer
Panchayat R&B Division
Morbi

Superintending Engineer
Panchayat R&B Circle-1
Rajkot

Work Details


Sr No.	Name of Road	Length in Kilometers.	Amount Put to Tender
1	1.KHAKHRECHI VENASAR ROAD, TA MADIYA, DIST MORBI.	-	11026075.81
2	2.RAVAPAR TO SADULKA ROAD, TA MORBI, DIST MORBI.	-	5138092.88
3	3.DHULKOT GHANTILA ROAD, TA HALVAD, DIST MORBI	-	8946011.88
4	4.DHAVANA JIVA ROAD, TA HALVAD, DIST MORBI	-	23885239.62
5	5.KANTIPUR BAGATHDA ROAD, DIST MORBI	-	16686764.57
6	6.Rasangpar-Meghpar-Delara road 1/200 to 1/300	-	4145264.44
7	7.Rasangpar-Meghpar-Delara road 19/400 to 19/500	-	2282676.20
8	8.Dhulkot to Ghantila road ch 1/400 - 1/500	-	583278.97
9	9.Dhulkot to Ghantila road ch 1/200 - 1/300	-	583278.97
10	10.Dhulkot to Ghantila road ch 0/400 - 0/500	-	668267.04
11	11.Dhulkot to Ghantila road ch 0/200 - 0/300	-	668267.04
	Total		74613217.41


**CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN
MORBI DISTRICT - PACKAGE -2**

**PROFORMA-A
(To Accompany with Submission of DTP)**

1. Tender Forms DTP			
A	Whether the Old clauses are replaced by the latest clauses as per Government instruction. ?		Yes
B	If yes, State the number wise details of clauses replaced.		-
C	Whether time limit entered its is proportion with the amount and number of work. ?		Yes
D	Whether the details vise mention of security Deposit etc. are written in tender form ?		As per SBD
2. Schedule-A			
A	Whether schedule-A gives details of the materials to be supplied under Schedule-A ?		To be purchase from open market through contractor.
B	Does it mention the correct place of delivery of materials to be supplied under Schedule-A ?		N.A
C	Whether the rates of materials are mentioned in the Figure as well as in the words. ?		N.A
D	Whether the rate entered in schedule-A is correctly Derived ?		N.A
E	Whether the rate entered in schedule-A correctly arrived at as norms ?		N.A


I have personally verified the fact as stated above and found in order.



 Divisional Accountant
 Panchayat R&B Division
 Morbi



 Executive Engineer
 Panchayat R&B Division
 Morbi

3. Bil of Quantitiy		
(i)	Whether the description of each item literely tally with the sanctioned estimate except specifying of lead etc. comp.	Yes.
(ii)	Whether quantity of each item is as per sanctioned estimate/ If not, state the reasons with due justification of deviation in covering letter of the DTP.	Yes.
(iii)	Whether the rate of each items is as per sanctioned estimate ? If not, state the reasons with due justification for Deviation in covering letter of the DTP. and incorporate the analysis in covering letter of DTP.	Yes.
(iv)	Whether unit of each item is per sanctioned estimate ? If not, state reasons with due justification for diviation in covering letter of DTP.	Yes.
(v)	Whether the rate of each item in BOQ is mentioned in words in case of % rate tender.	Yes.
(vi)	Whether the standard method is adopted in each item in writing the Units. (e.g Cubic meter to abbreviated as Cum and not applicable not C.M. etc.)	Yes.
(vii)	Whether the Govt, remarks if any observed at the time of according sanctioned are fully incorporate in the DTP. If, yes submit compliance report.	N.A.
(viii)	Whether correct name of work is entered at the top of BOQ	Yes.
(ix)	Whether standard form for BOQ is adopted.	Yes.
(x)	Whether the standard words for discount or premium on tendred rate as " I/ we am/are," is mentioneda at the end ?	N.A.
(xi)	Whether the amount worked out for each item is correctly calculated and submit up ?	Yes.
(xii)	Whether alternate items are proposed in the DTP, ? If yes state the Item no. for which alternative item is proposed,	No
4. Detailed of Specification		
(i)	Whether the detailed specification correctly reflect the tender Item ?	Yes.
(ii)	Whether items with sepcified lead and lift are counverted in to with all lead and lift.	Yes.
(iii)	Whether correct made of mesurement is mentioned ?	Yes.

(iv)	Whether correct mode of payment is as per BOQ ?	Yes.
(v)	Whether suitable use of excavated materials or cutting stuff is incorporated in the DTP. ?	N.A.
(vi)	Whether the mentioned regarding the test to be carried out before execution is made herewith in the respective item of DTP.	Yes Test schedule attached herewith.
(vii)	Whether reference to PWD hand book is specification of IRC clause are mentioned correctly and relevantly in the respective item ?	Yes.
(viii)	Whether the test to be carried out during execution is made ? Stated the item No. with description and details of tests to be carried out in brief ?	Yes Test schedule attached herewith.
(ix)	Whether average rate of earthwork derived and entered in BOQ If, yes give rate analysis.	No
(x)	Whether the description of each item literally and exactly with that in BOQ. ?	Yes.
4. Detailed of other items.		
(i)	Whether statement of item not put to tender is incorporated with detailed justification.?	No.
(ii)	Whether the amount of sanctioned estimated tally with the total of amount put to tender and amount not put to tender ?	Yes.
(iii)	Whether page number in DTP is made.	Yes.
(iv)	Whether permission to split up the work ? If yes give information with competent authority.	N.A.
(v)	Whether the general specification and other relevant records are incorporated DTP.	Yes.
(vi)	Whether Executive Engineer has signed the DTP. and all corrections are attested by him.	Yes.
(vii)	Whether the DTP. are submitted in well bound volume and in neat and tidy fashion /	Yes.


 A.A.E. (PB)
 R&B Division
 Morbi


 Deputy Executive Engineer
 Panchayat R&B Sub Division
 Morbi



 Executive Engineer
 Panchayat R&B Division
 Morbi


CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN MORBI
DISTRICT - PACKAGE -2


CERTIFICATE


This is Certify that


- 1.0 Description of the condition of contract attached with DTP are thoroughly checked and found a per gujarat Public works manuals.
- 2.0 The condition of contract and precibed from attached with DTP of the proposed Road works are ammended/modified/replaced as per the time to time instruction issued by Government.
- 3.0 BOQ memorandum and other precribed forms of DTP is 100% throughly checked w.r.t. arithmatically aspects and forund correct.


Senior Clerk
Panch. R&B Sub Division
Morbi


Deputy Executive Engineer
Panch. R&B Sub Division
Morbi


Tender Clerk
Panch. R&B Division
Morbi


Divisional Accountant
Panch. R&B Division
Morbi


Executive Engineer
Panch. R&B Division
Morbi


CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN MORBI
DISTRICT - PACKAGE -2


CERTIFICATE

This is Certify that

- 1.0 Description of the General Technical Specification the Detailed Specification of Items attached with DTP are thoroughly checked and found as per Gujarat public work manuals,
- 2.0 The General Technical specification and detailed sepcification of items of the proposed road works are amended/modified/replaced as per the time ti time istruction issued by the Government.
- 3.0 The detailed sepcification of each items are provided as per accorded technical sanctioned plan and estimated.
- 4.0 BOQ, C and schedule for restig of materials of DTP is thoroughly checked w.r.t technical aspects,
- 5.0 Submitted DTP is checked and verified with respect to all points and found is order personally and there is no any ambiguity of descerepancy so as to lead any finanacial or contractual implications.
- 6.0 Necessary required drawing i.e Index Map, Alighment plant and Taluka map and Typical cross section are attached with DTP

Add. Assi. Engineer
Panch. R&B sub Division
Morbi



Deputy Executive Engineer
Panch. R&B subDivision
Morbi



Executive Engineer
Panch. R&B Division
Morbi

CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN MORBI DISTRICT - PACKAGE -2

Error Statement

(A)	Amount put to Tender Rs.	₹	73,809,191	
	Grand Total	₹	73,809,191	(A)
(B)	Amount not put to Tender			
	Add. Contingency Charges	₹	782,054	
	Add 1% Q.C. Charges	₹	738,094	
	Add Consultancy services	₹	2,112,229	
	GST	₹	13,835,205	
	Total Rs.	₹	17,467,582	(B)
	A + B Rs.	₹	91,276,773	
	T.S. Amount Rs.	₹	91,286,770	
	Arithmetic Correction & Rounding	Rs. ₹	9,997	


Deputy Executive Engineer
(R & B) (P) Sub Division
Morbi


Executive Engineer
(R & B) (P) Division
Morbi

KHACHIRSCH VENGASAR ROAD, TA MADIVA, DIST NOBIL.

Sr. No.	Description	Unit	Section 1: Bridge Works			Section 2: Approach & Road Works			Section 3: Drainage works		
			Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.
1	Excavation including stripping of surface materials and disposal of unserviceable materials with all haul and lift, 1/1 R.C.C. work	Cum	160.00	1,260.23	199,676.32						
2	Excavation for foundation in sand, gravel, clay soft soils and boulders etc including shoring, shoring dismantling as necessary and disposing of the excavated soil as directed	Cum	1,436.31	511.11	734,533.80						
3	Providing and laying plain concrete in bedding course complete as per drawings and technical specifications as per sections 1000, 1700 and 2100 of M&WTM (M-15)	Cum	112.88	8,794.15	991,718.47						
4	Providing and laying plain concrete grade M-15 R.C.C. for wall for the foundation i.e. to prevent the slope sliding down, with graded machine mixed stone aggregate from 6 mm to 40 mm including tamping, shoring, hauling and curing complete with all formwork, dismantling, wherever required including all material, labour, plants, machinery & tools, lifts and lifts, etc. complete as per specification	Cum	153.07	3,773.18	577,438.88						
5	Providing and fixing in position (Thermally Mechanically Treated Bars) TMT Fe550 C/S conforming to IS 1786 reinforcing bars of various diameters for the structure - retaining wall, etc. as per detailed drawings and drawings and schedule including cutting, bending, bolting the bars, lashing with 15 days of work with cost of all labour, material, tools, plants, equipment, supporting as required with all lifts and loads etc. as complete as per specification and as directed by Engineer	MT	47.60	77,473.35	3,687,908.83						
6	Providing and casting in situ reinforced concrete M-20 for R.C.C. box structure, as per drawings, then of retaining wall etc. using 6 mm to 10 mm machine crushed well graded stone aggregate, used of approved quality, OPC (33 grade cement with contractor's own concrete mix design etc. complete as per specification.	Cum	461.76	5,304.81	2,449,424.63						
7	The rate is inclusive of all materials, including necessary roading in fully automatic batch mix plant, transport, curing, shoring, placing in position, making good the damages, filling embankment, earth, pickets, wherever necessary, with all haul and lift with contractor's labour, tools & plants, machinery, as required, with including cost of the finished work.	Sq.m	18.03	1,223.39	22,052.27						
8	Providing and laying 150mm thick concrete at the back of abutments, returns and wing walls as per detailed specifications.	Sq.m	118.00	139.08	16,410.81						
9	Back filling behind abutment, wing wall and return wall with selected granular material of approved quality including all the material, compacting, labour, equipment charges, etc. as complete as per drawing and technical Specification Section 100 (Percentage of fine content maximum 15%, flakiness not above 30%, Density 20 kN/m ³ , field compaction 95 ± 2% modified proctor density.	Cum	173.55	304.42	52,831.11						
10	Providing and laying rubble for apron (each stone weighing not less than 40kg) including and packing and filling in the interstices with quarry waste.	Cum	88.88	1,082.83	96,067.09						
11	Providing and laying plain concrete concrete grade M-20 carriage wall with maximum depth below their level of 2m on upstream and 2.5m on downstream side as per clause 20.3.2.2 of IRC:SP-11-2004 and section 2107.1 of M&WTM specifications.	Cum	123.10	4,391.53	540,833.38						

KANTIPUR BAGATHDA ROAD, DIST MOREBI

Sl. No.	Item of work	Section 1: Bridge Works			Section 2: Approach & Road Works			Section 3: Drainage works			Section 4: Bridge Works		
		Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.
1	Destruction including, checking of, serviceable materials and disposal of unserviceable materials with all load and lift (1) R.C.C. work	0.00	1,062.26	0.00							0.00	1,062.26	0.00
2	Excavation for foundation in sand, gravel, clay soft soils and murrum etc. including shoring, shuffling, dewatering as necessary and disposing of the excavated stuff as directed	1,586.58	512.11	810,948.04							311.00	312.11	158,955.37
3	1M Depth upto 3.0 M and load upto 100kn for 10 Corn Providing and laying plain cement concrete in harding course complete as per drawings and technical specifications as per sections 1550, 1550 and 2100 of MORTH, (M-33)	140.48	3,764.33	538,802.23							30.40	3,764.33	115,188.59
4	Providing and laying plain cement concrete grade M-25 R.C.C. For wall for the protection i.e. to prevent the slope slipping from sliding down, with graded machine mixed stone aggregate from 5 mm to 40 mm including tapping, vibrating, leveling and curing complete with all formwork, dewatering, laborer required including all materials, labour, plants, machinery & tools, all loads and lifts, etc. complete as per specification.	79.20	6,772.38	288,795.52							0.00	3,272.18	0.00
5	Providing and filling in position (Thermin mechanically Treated) (M-25) (FEDSD) CDS conforming to IS 1786 (reinforcing bars of various diameters for box structure) - retaining wall, etc. as per detailed drawings and drawings and schedule including cutting, bending, loading the bars, binding with 18 SWG CD wires with unit of all labour, materials, tools, plants, equipment, supporting as required with all lifts and loads etc. all complete as per specification and as directed by Engineer The rate includes for supply, loading, unloading, transporting to site, cutting, bending, lap length, handling, placing, tying in position with contractor's own labour, etc. including forming the cage and launching it in position in pits below etc. Working and supporting in position to ensure true and levels during concreting, maintaining proper cover/spacing, all loads & lifts, etc. including contractor's own equipment, labour, supervisor, taxes, machinery, etc. complete as per drawings and specification.	16.08	77,471.35	1,965,833.88							0.00	77,471.35	23,341.40
6	Providing and casting in situ reinforced cement concrete M-25 for R.C.C. box structure, as per drawings. Slabs of retaining wall etc. using 6 mm to 20 mm machine washed well graded river aggregate, used of approved quality, OPC 53 grade cement with contractor's own concrete mix design etc. complete as per specification. The rate is inclusive of all material, including necessary manning in full, separate batch mix plant, transport, curing, vibrating, placing in position, scaffolding, shoring, normal shuffling, formwork, dewatering carefully, making good the damages, fixing embedment, insert, pockets, whenever necessary, with all load and lift with contractor's labour, tools & plant, machinery, as required, with including cost of the fresh form work.	837.06	5,304.31	4,979,452.27							16.50	5,304.31	156,477.98
7	Providing and laying - 15mm Medium 800mm thick (vertical) at the back of abutments, returns and wing walls as per detailed specifications.	316.71	3,353.29	1,062,423.59							40.00	1,333.39	65,406.07
8	Providing & laying weep holes in abutments, and returns by using A.C. pipe of 100mm including laying in proper grade and joining the completed as per detailed specification.	326.00	110.08	36,088.48							34.00	116.88	3,983.58
9	Back filling behind abutments, wing wall and return wall with selected granular material of approved quality including all the materials, compacting, labour, equipment charges, etc. all complete as per drawing and Technical Specification Section 100 (Percentage of free cement maximum 13%, Bulk density 1600 kg/m ³ , Quantity 20 M ³ /m ² , Field interpenetration 95±2%, modified proctor density).	742.18	564.42	376,871.61							0.00	504.42	0.00
10	Providing and laying rubble for apron (fresh stone weighting not less than 40kg) including and packing and filling in the interstices with quarry quality For Bagd Apur.	310.92	1,089.81	113,114.48							71.60	1,089.81	77,653.86
11	Providing and laying plain cement concrete grade M-20 (curtain wall with minimum depth below floor level of 300 mm upstream and 250 mm downstream side as per clause 20.1.3.3 of IRC:SP-13:2004 and section 2507.6 of MORTH specification).	154.12	4,093.53	707,932.86							0.00	4,093.53	0.00

Ratangpur Meghwar-Dal

are road 1/200 to 1/500									
Rasangan-Meghvan-Delara road 10/400 to 15/500									
Sr. No.	Item of work	Section 1: Approach & Road Works			Section 2: Bridge Works			Section 3: Approach & Road Works	
		Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Amount in Rs.
1	Demolition including stacking of serviceable materials and disposal of unserviceable materials with all load and lift, (i) & C.C. work								
2	Excavation for foundation in sand, gravel, clay soft soils and mounds etc. including clearing, sloping, dewatering as necessary and disposing of the excavated stuff as directed.	115.00	511.11	58,777.72	118.00	511.11	60,311.04	18.00	9,200.00
3	Providing and laying plain cement concrete slabs as per sections 1500, 1700 and 1710 of MORTH (M-40)	17.00	5,764.33	98,193.61	17.00	5,764.33	98,193.61	17.00	98,193.61
4	Providing and laying plain cement concrete grade M-25 R.C.C. box wall for the protection i.e. to prevent the slope from sliding down, with graded machine mixed stone aggregate from 6 mm to 40 mm including temporary, clearing, leveling and curing (complete with all formwork, dewatering, whenever required including all materials, labour, plants, machines & tools, all loads and lifts, etc. complete as per specification.								
5	Providing and fixing in position (Thermally Mechanically Treated) TMT reinforcement bars of various diameters for box structure, retaining wall, etc. as per detailed design and drawings and schedule including cutting, bending, hooking the bars, loading with 28 days of curing with cost of all labour, materials, tools, plants, equipment, supporting as required with all lifts and loads etc. all complete as per specification and as directed by Engineer.	0.87	77,471.15	67,405.09	0.80	77,471.15	61,976.92	0.18	13,944.81
6	The rate is inclusive of all materials, including necessary mixing in fully automatic batch mix plant, transport, curing, starting, placing in position, scaffolding, staging, removal, shuttering, formwork, dewatering, clearing, leveling, grading the dewatering, filling embankment, earth, pockets, wherever necessary, with all load and lift with contractor's labour, tools & plants, machines, as required, with including cost of full fresh form work.				17.20	5,504.31	94,674.13		
7	Providing and laying - Filter Media 100mm which directed at the back of abutments, piers and wing walls as per detailed specifications.				42.00	1,373.19	57,603.78		
8	Providing & laying sweep hole in abutments, and return by using R.C. Pipe of 100mm including laying in proper grade and joining the compound as per detailed specification.	84.20	119.28	10,041.87	48.00	119.08	5,725.92	21.00	2,500.77
9	Back filling behind abutment, wing wall and return wall with selected granular material of approved quality including all the materials, compacting, labour, equipment charges, etc. all complete as per drawing and Technical Specification Section 100 (Percentage of fine content maximum 15%, Bulk density not less than 15.7 kN/m ³ , Dry density 15.7 kN/m ³ , Field compaction 95% modified proctor density.								
10	Providing and laying rubber for apron (each stone weighing not less than 10kg) including and joining and filling in the intersection with quarry rubble.				18.50	1,063.11	19,667.55		
11	Providing and laying plain cement concrete grade M-20 retaining wall with minimum depth below floor level of 1m on upstream and 1.5m on downstream side as per clause 20.1.3.2 of H&SP-13-2004 and section 2002.3 of MORTH specification.								

Checklist to Ghantila road ch 1/400 - 1/500

		Shulbut to Ghantla road ch 1/200 - 1/300				Shulbut to Ghantla road ch 3/400 - 0/500			
Sr. No.	Item of work	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.		
1.	Demolition including stacking of surplus materials and disposal of irretrievable materials with all load and lift. (1) R.C.C. work								
2	Excavation for foundation in sand, gravel, clay soft soils and reaction etc. including shoring, strutting, dewatering as necessary and disposing of the excavated stuff as directed. (A) Depth upto 3.0 M and load upto 100kn for 30 Cum Providing and laying plain concrete concrete in leveling course complete as per drawings and technical specifications as per sections 1200, 1700 and 1100 of MORTN (M-13)								
4	Providing and laying plain concrete concrete grade M-15 R.C.C. for wall for two protection i.e. to prevent the slope jacking from sliding down, with graded machine mixed stone aggregates from 6 mm to 40 mm including tamping, shoring, bracing and curing complete with all formwork, dewatering, labourer required including all materials, labour, plants, machinery & tools, all load and lift, etc. complete as per specification.								
5	Providing and fixing in position (Thermo mechanically treated bars) TMT Fe550D CRS conforming to IS 1786 reinforcing bars of various diameters for box structure, retaining wall, etc. as per detailed design and drawings and include including cutting, bending, loading the bars, loading with 18 SMO (6 bars with cost of all labour, materials, tools, plants, equipment, supporting as required with all lifts and loads etc. all complete as per specification and as directed by Engineer. The rate includes for supply, loading, unloading, transporting to site, cutting, bending, lap length, hoisting, placing, tying in position with contractor's own bonding wire, welding, forming the cage and lowering it in position in place etc. Working and supporting in position to ensure free and firm during concreting, providing proper cover/spacing, all loads & lifts, etc. including contractor's own equipment, labour, supervision, taxes, machinery, etc. complete as per drawings and specification.								
6	Providing and casting in situ controlled current concrete M-25 for R.C.C. box structure, as per drawings, skin of retaining wall etc. using 8 mm to 20 mm machine crushed well graded stone aggregates, sand of approved quality, OPC 53 grade cement with contractor's own concrete mix design etc. complete as per specification. The rate is inclusive of all materials, including necessary mixing in fully automatic batch mix plant, transport, curing, shoring, placing in position, scaffolding, staging, normal chattering, formwork, dewatering carefully making good the damages, filling embedment, inserts, pockets, wherever necessary, with all load and lift with contractor's labour, tools & plants, machinery, as required, with including cost of lay fresh form work.								
7	Providing and laying - Clear Media 500mm thick directed at the back of abutments, retaining and wing walls as per detailed specifications.								
8	Providing & laying weep hole in Abutments, and returns by using R.C. pipe of 100mm including laying in proper grade and joining the completed as per detailed specification.								
9	Back filling behind Abutment, wing wall and return wall with selected granular material of approved quality including all the rollers, compacting, labour requirement charges, etc. all complete as per drawing and Technical Specification Section 300 (Percentage of fine content maximum 15%, Bulk SG and pH 10". Density 10 kN/m ³ , Void composition 95.2% modified proctor density.								
10	Providing and laying rubble for apron (each three weighing not less than 40kg) including and jacking and filling in the intersection with quarry walls. Two rigid apron.								
11	Providing and laying plain concrete concrete grade M-20 curtain wall with minimum depth below floor level of 2m in upstream and 1.5m in downstream side as per clause 35.1.3 of MC-SP-11-2004 and section 1507.3 of MORTN specification.								

Disbursed to Shantala road on 01/200 - 01/2000						TOTAL			
Sr. No.	Specs of work	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Amount in Rs.
1	Demolition including stacking of serviceable materials and disposal of unserviceable materials with all load and lift, 1/18 C.C. work				881.28	1,062.35	732,721.04		732,721.04
2	Excavation for foundation in sand, gravel, clay with soft and medium etc. including shoring, strutting, dewatering in necessary and disposing of the excavated stuff as directed.				5,215.82	311.11	2,605,909.90		6,665,338.60
3	16" Depth upto 3.0 M. and load upto 12000 for 10 (10T)								
3	Providing and laying plain cement concrete in leveling course complete in per drawings and technical specifications in per sections 1500, 1700 and 2100 of MCRTD, (M-15)				788.79	3,704.33	2,948,810.80		2,948,810.80
4	Providing and laying plain cement concrete grade M-15 R.C.C. Two wall for base protection i.e. to prevent the slope pitching from sliding down, with graded machine road stone aggregate from 6 mm to 40 mm including tamping, vibrating, leveling and curing complete with all formwork, dewatering wherever required including all materials, labour, plants, tools/equipment & loads, all loads and lifts, etc. complete as per specification.								
4					308.60	3,772.18	1,164,189.79		1,164,189.79
5	Providing and filling in position (Thermo mechanically Treated bars) TMT 45500 CMS conforming to IS 1786 reinforcing bars of various diameters for floor slabs, retaining wall, etc. as per detailed design and drawings and schedule including cutting, bending, loading the bars, loading with 18 Yott (18) wires with cost of all labour, materials, tools, plant, equipment, supporting as required with all lifts and loads etc. all complete as per specification and as directed by Engineer								
5	The rate includes for supply, loading, unloading, transporting to site, cutting, bending, lap length, hooking, placing, tying in position with contractor's own binding wire, welding, turning the tags and bearing it in position in pile base etc. Welding and supporting in position to ensure firm and levels during concreting, maintaining proper cover/spacing, all loads & lifts, etc. including contractor's own equipment, labour, expenditure, tools, materials, etc. complete as per drawings and specification.				328.35	77,471.45	25,581,484.13		25,581,484.13
6	Providing and casting in situ controlled cement concrete M-25 for R.C.C. base slabs, as per drawings. Slabs of retaining wall etc. using 8 mm to 10 mm machine crushed well graded zone aggregate, sand of approved quality, OPC 52 grade cement with contractor's own estimate mix design etc. complete as per specification.								
6	The rate is inclusive of all materials, including necessary visiting in fully automatic batch mix plant, transport, curing, vibration, placing in position, scaffolding, staging, removal shoring, formwork, dewatering, care/look, making good the damages, firing embedment, inserts, pockets, whenever necessary, with all load and lift with contractor's labour, tools & plants, machines, as required, with including cost of fix form work.				3,394.23	5,304.32	18,004,043.51		18,004,043.51
7	Providing and laying - filter media 500mm thick directed at the back of abutments, returns and wing walls as per detailed specifications.				920.01	-1,133.30	1,111,168.30		1,111,168.30
8	Providing & laying weep hole in abutments, and returns by using A.C. pipe or 100mm including laying in proper grade and joining the compressed as per detailed specification.				818.00	119.08	100,317.07		100,317.07
9	Back filling behind abutment, wing wall and return wall with selected granular material of approved quality including all the materials, compacting, labour equipment charges, etc. all complete as per drawing and Technical Specification Section 300 (Percentage of fine sand maximum 15%, Buckle sold pH 10", Density 20 kN/m ³ , field compaction 95 ± 2% modified proctor density)				2,183.61	504.42	1,101,467.75		1,101,467.75
10	Providing and laying rods for approx. each drive weighing not less than 40kg, including end packing and filling in the intersection with spigot/splugs, for fixed sign.				646.94	1,003.81	701,164.89		701,164.89
11	Providing and laying plain cement concrete grade M-20 surface wall with provision depth below floor level of 1m on upstream and 2.5m on downstream side as per clause 26.1.2.3 of IS:5013-2004 and section 2507.6 of MCRTD specification.				789.14	4,591.53	3,623,389.84		3,623,389.84

KHAKHRECH VEMASAR ROAD, TA MADHWA, DIST MUMBAI

Sl. No.	Item of work	Unit	Section 3: Bridge Works				Section 1: Approach & Road Works				Section 2: Overhead works	
			Quantity	Rate	Amount in Rs.		Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.
12	Providing and laying outside for apron (each side) weighing not less than 45kg) including and filling to the intersection with quarry spurs for Flexible Apron.	Cum	291.79	1,081.81	315,719.48							
13	Providing and laying Filter Horizontal underdrain stitching in depth 300mm (this complete as per drawing and Technical specifications)	Sqm	81.81	305.84	25,008.91							
14	Providing and laying Bitching on slopes laid over prepared filter media including border apron laid dry in front of toe of embankment complete as per drawing and Technical specifications.	Cum	26.34	1,136.98	29,944.14							
15	Providing and casting in the reinforced cement concrete M-25 for Parapet wall, as per drawing. Item of Parapet wall etc. using 6 mm to 20 mm modulus crushed well graded stone aggregates, sand of approved quality, OPC 53 grade cement with contractor's own concrete mix design etc. complete as per specification.	Cum	41.64	5,304.31	220,871.18							
16	Providing and casting in situ codified cement concrete M-30 for average 75 mm thick wearing coat laid as directed including tamping, vibrating, finishing and filling joints with slabs complete	Cum	20.08	5,536.10	111,171.87							
17	Clearing and grubbing road level including spreading well vegetation grass bushes, debris, topsoil and trees girth up to 300 mm removal of stumps of trees cut earlier and disposal of unserviceable materials (OC) By mechanical means in area of light jungle	Hectare		28,434.57		0.05	28414.36548	1,421.75				
18	Reinforcing of Reinforced Layer	cum		256.75		32.00		256.75	8,218.00			
19	Reinforcing of Gravel Layer	cum		85.25		184.00		85.25	85,734.00			
20	Sanework for embankment including breaking clods, dressing with all levels and lifts and including watering rolling and consolidation of subgrade in layers at 0 M.C. to required dry density including filling the depression which occur during the process using power roller RT to 20T (C) from borrow area within 3.0KM lead.	Cum		236.97		703.63	236.9688669	181,431.15	909.63	233.07	215,283.50	
21	Construction of sub grade and earthen shoulders using quarry spoil with all lead and lifts and including watering and rolling and consolidation of sub grade in layers at OMC to required dry density including filling the depression which occur during the process using power roller RT to 10 T	cum		389.78		234.50		389.78	79,342.36			
22	Construction of granular Sub base with Course Graded Material (Grade II) (Table-60) 21 of 200 mm by providing coarse graded material (Metal Crushed) using size 3.0mm to 26.5 mm @ 27.5%, 26.5 mm to 63 mm @ 22.5%, 63 mm to 4.75mm @ 12.50% and 4.75mm below @ 37.5% spreading in uniform layers with including and mixing the material obtained from setting 8T road by rolling machine using motor grader on prepared surface mixing by mix to place method with vibrator at OMC and compacting with vibratory roller to achieve the desired density complete as per Clause 801.2 Table 400.1 grade-II	cum		1,111.11		81.50		1,111.11	90,777.89			
23	Providing, laying, spreading and compacting stone aggregates of specific sizes in water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregates, watering and compacting to the required density-Grading I, Using Screening Suitable type such as Moorum or Gravel.	Cum		1,620.00		48.76		1,620.00	78,990.98			
24	Cement Concrete Pavement (Construction of un-reinforced, dowel jointed, plain, sealed concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 882, maximum size of coarse aggregate not exceeding 25 mm, transported by one wheel, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation expansion, resistant primer, joint sealer, debinding oils, dowel bar, tie rods, abutments as approved, using compound, finishing to lines and grades as per drawing)	Cum		5,543.87		86.38		5,543.87	479,211.98			

RAVAPARI TO SAKULKA ROAD, TA MORSE, DIST MORBI.

CHULKET GHATFLA ROAD, TA

Sl. No.	Item of work	Section 1: Bridge Works			Section 2: Approach & Road Works			Section 3: Drainage works			Section 4: Bridge Works			Section 5: Approach &		
		Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.
12	Providing and laying rubble for apron (each more weighting not less than 40kg.) including end packing and filling in the interstices with quarry spalls for flexible apron.	81.43	1,081.81	88,123.47							0.00	1,081.81	0.00			
13	Providing and laying filter material underneath piling in stages 300mm thick complete as per drawing and Technical specification.	104.25	809.84	84,310.86												
14	Providing and laying Piling on slopes laid over prepared filter muck including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical specification.	31.88	1,116.19	35,579.03												
15	Providing and casting in situ controlled cement concrete 14:20 for Parapet Wall, as per drawings, Item of Parapet wall etc. using 6 mm to 20 mm machine crushed well graded stone aggregate, sand of approved quality, OPC 53 grade cement with contractor's own concrete mix design etc. complete as per specification.	21.79	3,304.32	72,091.48							14.94	5,304.31	78,513.74			
16	Providing and casting in situ controlled cement concrete 14:30 for average 75 mm thick wearing road laid as desired including tamping, vibrating, finishing, curing and flange path with bitumen complete	7.71	5,516.30	42,529.58							15.41	5,516.30	85,175.19			
17	Cleaning and grubbing road level including uprooting such vegetation grass bushes, shrubs, sapling and trees girth up to 200 mm removal of stumps at trees cut earlier and disposal of unserviceable materials (C) by mechanical means in area of right of way				0.00	28,434.91	1,121.60							0.02	28,434.91	
18	Overhauling of Bluestone Layer															
19	Overhauling of Gravel Layer				27.52	294.75	7,865.19					294.75	7,865.19	10.24	294.75	
20	Overhauling of sub-grade and surface shoulders using quarry spoil with at least 80% and including watering and rolling and consolidation of sub-grade in layers at O.M.C. as required dry density including filling the depression which occur during the process using power roller RT to 10T (E) from borrow area within 5.00M land.				138.24	317.25	43,651.20					317.25	43,651.20	18.88	317.25	
21	Construction of sub-grade and surface shoulders using quarry spoil with at least 80% and including watering and rolling and consolidation of sub-grade in layers at O.M.C. as required dry density including filling the depression which occur during the process using power roller RT to 10 T				565.24	216.97	122,644.86	130.20	216.97	28,271.67				0.00	216.97	
22	Construction of granular Sub base with Coarse Graded Material (Grade II) (Table: 400-2) of 200 mm by providing coarse graded material (Mottal Crushed) using size 50mm to 36.5 mm @ 27.5%, 36.5 mm to 6.3 mm @ 22.5%, 6.3 mm to 4.75mm @ 22.50% and 4.75mm below @ 27.5% spreading in uniform layers with including and mixing the material obtained from cutting RT road by rolling machine using motor grader on prepared surface mixing by 100 mm plate method with vibrator at O.M.C. and compacting with vibratory roller to achieve the desired density complete as per Clause 401.2 Table 400.1 grade II		1,111.11		71.82	1,111.11	79,800.10					1,111.11		0.00	1,111.11	
23	Providing, laying, spreading and compacting stone aggregate of specific size to water bound macadam Specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to prepare grade and surface, applying and brooming requisite type of screening/finishing Materials to fit up the interstices of coarse aggregate, watering and compacting to the required density, Grading 1, Using Screening, Grubbable type such as Masonry or Road.				41.97	1,628.00	67,918.21							0.00	1,628.00	
24	Cement Concrete Pavement (Construction of un-reinforced, dressed jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 385, maximum size of coarse aggregate not exceeding 25 mm, transported to site, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membranes, surface primer, joint sealant, debonding agent, blow box, to not, admixture as approved, curing compound, finishing to base and grades as per drawing)				74.18	5,543.87	412,364.07							27.61	5,543.87	

KANTIPUR BAGATHODA ROAD, DIST MORBI

Ratangpur Meghaya One

Sl. No.	Item of work	Section 1. Bridge Works			Section 2. Approach & Road Works			Section 3. Diversion works			Section 4. Bridge Works		
		Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.
12	Providing and laying rubble for apron (each above weighing not less than 400kg) including and packing and filling in the interstices with quarry spalls for flexible apron.	102.15	3,081.81	315,560.11							0.00	1,081.81	0.00
13	Providing and laying 15cm natural uncrushed pitting in above 300mm thick concrete as per drawing and Technical specification.	8.00	300.84	0.00							0.00	309.84	0.00
14	Providing and laying 15cm concrete over prepared filter, ready including border apron laid dry in form of toe of embankment complete as per drawing and Technical specifications.	0.00	1,316.59	0.00							0.00	1,316.59	0.00
15	Wall, as per drawings, item of Pier and wall, using 6 mm to 20 mm machine crushed well graded stone aggregate, sand of approved quality, OPC 53 grade cement with contractor's own concrete mix design etc. complete as per specification.	0.00	3,204.31	0.00							0.00	3,204.31	0.00
16	Providing and casting in situ reinforced concrete M30 for average 75 mm thick wearing surf laid as directed including tamping, vibrating, finishing, curing and filling joints with bituminous mastic.	25.76	5,116.59	1,327,27.85							10.80	5,116.10	60,343.52
17	Clearing and grading road land including uprooting with vegetation grass bushes, shrubs, saplings and trees up to 100 mm removal of stumps of trees not sapling and disposal of unserviceable materials (C) by mechanical means in area of right of way.				0.09	18,434.97	2,559.15					28,434.97	
18	Clearing and grading of sub-grade and earthwork shoulder using heavy soil with at least 8% and including watering and rolling and consolidation of sub-grade.				0.00	256.75	0.00					256.75	
19	Graveling of sub-grade layer				0.00	327.25	0.00					327.25	
20	Earthwork for embankment including breaking clods, dressing with all soil and 10% and including watering rolling and consolidation of sub-grade in layers at O.M.C. to required dry density including filling the depressions which occur during the process using power roller RT to 20T (C) From Borrow area within 1.0KM haul.				1,508.51	235.97	357,478.18					246.97	
21	Construction of sub-grade and earthwork shoulder using heavy soil with at least 8% and including watering and rolling and consolidation of sub-grade in layers at O.M.C. to required dry density including filling the depressions which occur during the process using power roller RT to 20 T.				478.11	285.78	1,38,500.34					285.78	
22	Construction of granular sub base with Coarse Graded Material (Grade II) (Table-400.2) of 200 mm by providing coarse graded material (Crushed) using size 15mm to 25.5 mm @ 27.5%, 25.5 mm to 47.5 mm @ 22.5%, 47.5 mm to 75 mm @ 12.5%, and 75 mm below @ 17.5% spreading in uniform layers with including and rolling the material obtained from cutting RT roadways rolling machine using roller grader on prepared surface using 30 mm plate method with roller at O.M.C. and compacting with vibratory roller to achieve the desired density complete as per Clause 401.2 Table 400.1 grade V.											3,111.11	
23	Providing, laying, spreading and compacting stone aggregates of specific size to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to prepare grade and surface, applying and tamping requisite type of surfacing Binding Material to fill up the interstices of coarse aggregates, watering and compacting to the required density, Grading 1, Using Screener, Gravelable type such as Motor or Gravel.				0.00	1,610.00	0.00				11.00	1,610.00	17,815.95
24	Current Concrete Pavement (Construction of un-reinforced, double jointed plain concrete pavement) over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, transported to site, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler separation membrane, surface primer, joint sealant, debonding strip, down but, no rock, sub-base as approved, curing compound, finishing to level and grade as per drawing.)				250.23	3,543.87	892,855.17					3,543.87	

[illegible]

Dhulian to Ghoraila road ch 1/200 - 1/200							Dhulian to Ghoraila road ch 0/200 - 0/200		
Sr. No.	Item of work	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate
12	Providing and laying roller for stones (each stone weighting not less than 40kg) including and packing and filling in the interstices with quarry (chips) for Flexible Apron.								
13	Providing and laying Filter material underneath piling in drains 300mm thick concrete as per drawing and Technical specification.								
14	Providing and laying Piling on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical specifications.								
15	Providing and casting in situ reinforced cement concrete M-25 for Parapet Wall, as per drawings. Item of Parapet wall etc, using 8 mm to 20 mm machine crushed well graded stone aggregate, sand of approved quality, OPC 53 grade cement with contractor's own concrete mix design etc. complete as per specification.								
16	Providing and casting in situ reinforced cement concrete M-30 for average 75 mm thick wearing coat laid as directed including tamping, vibrating, finishing, curing and filling joints with bitumen concrete.								
17	Clearing and grubbing road land including spreading tank vegetation grass bushes, shrubs, sapling and trees girth up to 300 mm removal of stumps of trees not earlier and disposal of unserviceable materials (C) By mechanical means in area of right-of-way.								
18	Discontinuation of Bituminous Layer								
19	Discontinuation of Granular Layer								
20	Earthwork for embankment including breaking clods, dressing with all leaf and 4/1 and including watering rolling and consolidation of subgrade in layers at O.M.C. to required dry density including filling the depression which occur during the process using power roller BT to 10T (3) from borrow area within 3.0KM limit.								
21	Construction of sub-grade and earthen shoulder using quarry spoil with all leaf and 4/1 and including watering and rolling and consolidation of sub grade in layers at O.M.C. to required dry density including filling the depression which occur during the process using power roller BT to 10 T.								
22	Construction of granular Sub base with Quarry Graded Material (Grade II) (Table: 400-2) of 100 mm by providing coarse graded material Metal Crushed using size 37.5mm to 28.5 mm @ 27.5%, 24.5 mm to 9.5 mm @ 22.5%, 9.5mm to 4.75mm @ 12.5%, and 4.75mm bottom @ 37.5% spreading in uniform layers with including and mixing the material obtained from cutting BT road by grading machine using motor grader on prepared surface mixing by roller plus method with roller at O.M.C. and compacting with vibratory roller to achieve the desired density complete as per Clause 601.2 Table 600.1 grade II.								
23	Providing, laying, spreading and compacting close aggregate of specific size in wetter based on technical specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and weather, applying and brooming impervious type of dressing (Sealing Materials) to fill up the interstices of coarse aggregate, watering and compacting to the required density (Grading 1. Using Screening Cradleable Type such as Mason or Gravel).	14.00	1,025.00	22,575.94	14.00	1,025.00	22,575.94		
24	Cement Concrete Pavement (Construction of an reinforced, dense jointed plain cement concrete pavement over a prepared sub base with 4/1 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, transported to site, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, abutments as approved, curing compound, finishing to level and grades as per drawing.)								

Contract to Ghumilla road ch 0/200 - 0/800						TOTAL		
Sl. No.	Item of work	Quantity	Rate	Amount in R.	Quantity	Rate	Amount in R.	
12	Providing and laying subbase for asphalt (each stone weighing not less than 10kg) including and packing and filling in the interstices with quarry spalls. Per Flexible Asphalt.				654.42	1,083.81	710,604.09	
13	Providing and laying filter material underneath affixing in shape 200mm thick complete as per drawing and Technical specification.				194.06	300.84	60,127.26	
14	Providing and laying affixing on slopes laid over prepared filter media including binder upon laid dry in front of low pH environment complete as per drawing and Technical specifications				18.22	1,116.39	66,170.37	
15	Providing and casting in situ reinforced concrete M-20 for Parapet (that, as per drawings. Items of Parapet wall etc, using it not to 20 mm machine crushed and graded stone aggregate, sand of approved quality, OPC 53 grade cement with contractor's own admixers etc design etc, complete as per specification.				88.38	5,304.21	521,816.59	
16	Providing and casting in situ reinforced cement concrete M-30 for average 75 mm thick wearing surf laid as described (including tamping, vibrating, finishing, curing and filling joints with bitumen complete)				227.90	3,336.10	1,351,864.69	
17	Clearing and grubbing trial bed including spraying rail, vegetation grass bushes, shrubs, saplings and trees girth up to 100 mm removal of stumps of trees cut earlier and disposal of non-combustible materials (C) by mechanical means in area of right of way				0.27	28,494.97	10,510.94	
18	Discontinuity of Bituminous Layer				80.15	156.75	25,162.01	
19	Discontinuity of Gravel Layer				518.39	157.25	180,194.81	
20	Earthwork for embankment including breaking clods, dressing with all kind of fill and including watering rolling and consolidation of subgrade in layers at O.M.C. for required dry density including filling the depression which occur during the process using power roller 8T to 10T (C) from borrow area within 8.00M haul.				5,875.08	236.97	1,386,543.04	
21	Construction of sub-grade and earthen shoulders using quarry spall with all kind of fill and including watering and rolling and consolidation of sub grade in layers at O.M.C. to required dry density including filling the depression which occur during the process using power roller 8T to 10 T				1,222.04	280.78	354,117.19	
22	Construction of granular Sub base with Coarse Graded Material (Grade 0) (Table - 400-2) of 200 mm by providing coarse graded material Metal Crushed using size: 50mm to 26.5 mm @ 27.5%, 26.5 mm to 9.5 mm @ 21.5%, 9.5mm to 4.75mm @ 11.50% and 4.75mm below @ 37.5% spreading in uniform layers with including and rolling the material obtained from setting 8T road bed rolling machine using roller grader on prepared surface mixing by mix to place method with vibrator at O.M.C and compacting with vibratory roller to achieve the desired density complete as per Clause 401.3 Table 401.3 grade-V				155.82	1,311.11	172,198.18	
23	Providing, laying, spreading and compacting stone aggregate of specific size to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming required type of screening/finishing materials to fill up the interstices of coarse aggregate, watering and compacting to the required density, Grading 1, using Brooming Crustible type such as Mixture of Gravel.	14.00	1,670.00	23,379.54	181.52	1,830.00	456,061.11	
24	Cement Concrete Pavement (Construction of unreinforced, dressed jointed plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 3812, maximum size of coarse aggregate not exceeding 25 mm, transported to site, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, wearers members, salient prism, joint sealant, debonding strip, dowel bar, tie rods, substitutes as approved, curing compound, finishing to line and grades as per drawing)				184.00	5,543.87	2,178,465.00	

KHAMRUCH VENGAR ROAD, TA MACHHA, DIST MORBE.

Sl. No.	Unit	Section 1: Bridge Works			Section 2: Approach & Road Works			Section 3: Drainage works		
		Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.
ITEMS of work										
25	Providing and fixing sign boards made out of 2.0 mm aluminium sheet / 4 mm ACP (Aluminium Composite Panel) size 900x600 mm, rectangular as per design of IRC-67-2012. The treated with phosphating process & acid etching, coated with one coat of epoxy primer and two coats of best quality epoxy paint, reflective with M200 Prismatic Grade retro reflective sheeting of Type-11 as per ASTM D-4956 and latest M.O.S.T. Specifications; 1.80m long dished joint from outside side with angle of 95 x 35 x 3mm; painted with best quality epoxy coating in black and white bands. The details of symbol board shall be as per specification of engineer in charge. The fixing at site shall be in 12.5 x 75 x 6mm / 60MM Circular MS Pipe as required and frame fabricated using etc. complete under the supervision of engineer in charge. A warranty for 20 years for the Retro reflective sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab for the product offered shall be submitted by contractor. (A) Class-C Type-11 Retro Reflective sheeting.	Nos.	3,666.30		2.00	3,666.30	7,332.60			
26	Supplying and fixing reinforced concrete heavy duty man pressure pipes with collars for culverts carrying heavy traffic as per (i) 408-1391, specifications including setting the pipes in C.M. 1:2 watering and laying (on level or slopes) of Class 100 of following internal diameters (a) 900mm dia.	Best	5,488.26					40.00	3,488.26	136,130.56
27	Excavation for foundation in hard morren and boulders and very stiff or sticky, clay and other similar strata including shoring and strutting and dewatering as necessary and disposing of the excavated stuff as directed.	Cum	811.22							
28	Providing and laying plain cement concrete grade M-20 / RCC protection with with graded machine mixed stone aggregate from 4 mm to 40 mm including tamping, vibrating, leveling and curing complete with all formwork, dewatering whenever required including all materials, labour, plants, machinery & tools, etc. complete as per specification.	Cum	4,342.23							
29	Providing MS Flood gauge on top of the bridge including supply, fixing and jointing complete as directed by engineer in charge.	Nos	1,877.34							
30	Excavation in large boulders and soft rock by working including shoring, strutting and dewatering as necessary and disposing of the excavated stuff as directed.	Cum	216.55							
31	Providing and laying plain cement concrete in leveling, concrete complete as per drawings and technical specifications as per sections 1500, 1350 and 2130 of MCM211 (M&S).	Cum	2,345.18							
32	Transition sign board / Providing & Fixing sign boards made out of 2mm aluminium sheet, size 180 x 60 mm, rectangle as per the attached drawing pre-treated with phosphating process & acid etching, coated with one coat of epoxy primer and two coats of best quality epoxy paint reflective with retro reflective sheeting as per latest M.O.S.T. Specifications; Letters and numerals should be as per IRC-30-1968.3.1 (sign Class) standard and frame fabricated from iron, angle of 35x35mm, 35x50mm, painted with best quality epoxy coating in black and white bands. The fixing at site shall be in 12.5 x 75 x 6mm / 60MM Circular MS Pipe as required and frame fabricated using etc. complete under the supervision of engineer in charge. (A) Engineer Grade (V)	Nos.	6,798.32							
33	Gravel sub base Grade 1 with black trap crushed stone well graded material (Table-406.1) by mix in place method construction of gravel sub base by providing black trap crushed stone well graded material, spreading in uniform layers with motor grader on prepared surface, rolling by roller in place method with vibrator at 0.5m and compacting with vibratory roller to achieve the desired density complete. (In per technical specification class-401) for G-1 Material	Cum	1,116.04							
34	Providing, laying, spreading and compacting coarse aggregates of specific size for sub base maximum specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to achieve grade and camber, applying and brooming resistant type of screening, binding Materials to fill up the interstices of coarse aggregates, watering and compacting to the required density. Grading 2, Using Screening Crustable type such as Morren or Gravel.	Cum	1,438.17							

HALVARD, DIST MORBI									
DHAVANA NVA ROAD, TA HALVAD, DIST MORBI									
Sr. No.	Item of work	Section 1: Drainage works			Section 2: Bridge works			Section 3: Road works	
		Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Amount in Rs.
25	Providing and fixing sign boards made out of 1.0 mm aluminium sheet / 4 mm ACP (aluminium composite Panel) size 500x50 cms, rectangular as per design of MC-63-3012. Pts treated with phosphoric process & acid etching, coated with one coat of epoxy primer and two coats of best quality epoxy paint. Reflected with Micro Prismatic Grade retro reflector of Type-11 as per ASTM D-4956 and latest M.O.S.T. Specifications. 1. Best long strand grade of 75 x 25 x 6mm / 6548 Circular MS Pipe as required and finer fabricated from suitable size iron angle of 75 x 25 x 6mm painted with best quality epoxy coating in black and white bands. The details of special hatched board shall be as per the instructions of engineer in charge. The flag at site shall be in 2:2.4 CC (1:1.2) size 45 x 45 x 60 Cms. for each leg including excavation, curing etc. complete under the supervision of engineer in charge. A warranty for 25 years for the fabric retaining sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab for the product offered shall be submitted by contractor. (As Class-C Type-11) Demo reflective sheeting.	7,521.61							
26	Supplying and fixing reinforced concrete heavy duty non-pressure pipes with rollers for culverts carrying heavy traffic; as per IS 4084-1993 specifications including setting the pipes in C.M. 1:2 watering and laying 100 mm or 150mm of class M75 of following internal diameters (i) 900mm dia.	45.00	3,402.26	153,101.70					
27	Excavation for foundation in hard moisture and location and very stiff or sticks, clays and other similar strata including shoring and shiffling and sheetpiling as necessary and disposing of the excavated stuff as directed.				2,328.87	611.33	1,421,967.55		
28	Providing and laying plain cement concrete grade M-20 RCC protection wall, with graded heavier mixed stone aggregate from 5 mm to 40 mm including tamping, vibrating, leveling and curing complete with all formwork, shoring, wherever required including all materials, labour, plants, machines & tools, all leads and lifts, etc. complete as per specification.				122.00	4,142.22	505,771.52		
29	Providing MS Fixed grapple on top of the bridge including supply, fixing and painting complete as directed by engineer in charge.				2.00	1,897.54	3,795.07		
30	Incursion in large boulders and soft rock by wedging including shoring, prying and dismantling as necessary and disposing of the excavated stuff as directed.				8.00	716.55	6,000		
31	Providing and laying plain cement concrete in leveling concrete complete as per drawings and technical specifications as per sections 1150, 1170 and 2130 of M.O.R.T. (2015).				0.00	3,345.38	0.00		
32	Dimensioning board : Providing & fixing sign boards made out of 2mm aluminium sheet, size 500 x 60 cms, rectangular as per the attached drawing provided with phosphating process & acid etching, coated with one coat of epoxy primer and two coats of best quality epoxy paint reflected with ultra reflective sheeting as per latest M.O.S.T. Specifications; Letters and numerals should be as per MC-30-1208, 1.5m long (200) stand post and frame fabricated from iron angle of 35x35x3mm, 50x50x3mm painted with best quality epoxy coatings in black and white bands. The flag at site shall be in 2:2.4 CC (1:1.2) size 45 x 45 x 60mm for each leg, including excavation curing etc. complete under the supervision of engineer in charge. (As Engineer Grade/VII)	4.00	4,798.91	27,395.68					
33	Granular sub base 150mm 1 with black trap crushed stone well graded material (0.075-4.75) by mix in place method construction of granular sub base by providing black trap crushed stone well graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with vibrator at 0.4M and compacting with vibratory roller to achieve the designed density complete. (As per technical specification clause-451) for (As per Material)	79,820.55							
34	Providing, laying, spreading and compacting stone aggregate of specific stone for water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8.13 tonnes in stages in proper grade and subgrade, applying and tamping requisite type of screening/ bedding material to fill up the interstices of coarse aggregate, watering and compacting to the required density. Grading 2. Using Screwing Grapple type such as Mowens or Gravel.	22,489.81							

Sr. No.	Item of work	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.
25	Providing and fixing sign boards made out of 2.0 mm aluminium sheet / 4 mm ACP (Minimum composite panel), size 800x90 mm, rectangular as per design of IRC-57-2012. Pre treated with phosphating process & acid etching, coated with one coat of epoxy primer and two coats of best quality epoxy paint. Reflective with Macro Promatic Grade retro reflective sheeting of Type-13 as per ASTM D-4956 and latest M.O.3.7 Specifications. 1800mm long stand post of 75 x 75 x 6mm / 55188 Circular MS Pipe as required and frame fabricated from solid mild steel with angle of 35 x 35 x 3mm, painted with best quality epoxy paint in black and white bands. The details of symbol for each board shall be as per the instructions of engineer in charge. The fixing of sign shall be in 1:2.4 CC block of size 45 x 45 x 60 Cms. for each leg including excavation, laying of concrete, curing, etc. under the supervision of engineer in charge. A warranty for 10 years for this item effective from the date of completion of work. A certified copy of 3 year outdoor exposure test report from third party test lab for the product offered shall be submitted by contractor. (A) Class-C Type-13. (B) Retro reflective sheeting.	10.00	3,666.20	36,662.00			36,662.00
26	Supplying and fixing reinforced concrete heavy duty non-petroleum epoxy with load for vehicles carrying heavy traffic as per IS 439:1991 specifications including setting the pipes in CM 1:2 watering and laying the level or deposit of class 40/3 of following internal dimensions, (a) 900mm dia.	130.00	2,400.26	312,033.80			312,033.80
27	Groundwork for foundation in hard materials and boulders and very stiff or sticky, clay and other similar strata including boring and strutting and abutting as necessary and disposing of the excavated stuff as directed.	1,520.87	611.32	929,667.35			929,667.35
28	Providing and laying plain cement concrete grade M 20 PCC protective wall with graded machine mixed stone aggregate from 6 mm to 40 mm including formwork, vibrating, bedding and curing concrete with all formwork dismantling whenever required including all materials, labour, plants, machines & tools, all hauls and lifts, etc. complete as per specification.	227.55	4,142.22	942,562.84			942,562.84
29	Providing MS Fluid gauge on top of the bridge including supply, fixing and painting complete as directed by engineer in charge.	3.00	1,817.56	5,452.68			5,452.68
30	Installation in large boulders and stiff rock by working including shoring, mucking and dewatering as necessary and disposing of the excavated stuff as directed.	341.47	716.55	244,868.51			244,868.51
31	Providing and laying plain cement concrete in leveling slabs complete as per drawings and technical specifications as per sections 1000, 1700 and 2200 of MOORTH (RM 100)	11.00	3,345.36	36,798.96			36,798.96
32	Direction sign board : Providing & fixing sign boards made out of 2mm aluminium sheet, size 180 x 60 cms, rectangular as per the attached drawing pre treated with phosphating process & acid etching, coated with one coat of epoxy primer and two coats of best quality epoxy paint reflective with yellow reflective sheeting as per latest M.O.3.7. Specifications, letters and numerals should be as per IRC-30-1984.3 (m long) stand post and frame fabricated from 75mm angle of 35x35x3mm, 1800mm long, painted with best quality epoxy paint in black and white bands. The fixing of sign shall be in 1:2.4 CC block of size 45 x 45 x 60cms for each leg, including excavation, curing, etc. complete under the supervision of engineer in charge (A) Engineer Grade (V)	4.00	6,798.92	27,195.68			27,195.68
33	Granular sub base Grade 1 with black trap crushed stone well graded nominal (Table-400.2) by mix in place method construction of granular sub base by providing black trap crushed stone well graded material, spreading in uniform layers with motor grader on prepared surface, rolling by mix in place method with roller at CMC and compacting with vibratory roller to achieve the desired density complete. (a) per technical specification clause-401) for Gr 1 Material	26.72	2,118.04	56,603.05			56,603.05
34	Providing, laying, spreading and compacting stone aggregates of specific size in water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller & 10 tonnes in stages to proper grade and camber, rubbing and bruising requisite type of screening. Binding Materials to 10% of the intention of coarse aggregate, wetting and compacting to the required density. (a) using Screening Crustible Type such as M-sand or (b) gravel.	305.52	1,418.17	433,164.88			433,164.88

CANTIPUR BAGATHOA ROAD, DIST MORBI

Kansarpur Mahipal-Dal

Sl. No.	Item of work	Section 1: Bridge Works			Section 2: Approach & Road Works			Section 3: Drainage works			Section 4: Bridge Works		
		Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.
35	Informative Sign: Providing and fixing work in progress sign boards made out of zinc aluminum sheet, size 80 x 60cm rectangle as per the design of IRC 43/1977 are treated with phosphating process & acid testing, coated with one coat of epoxy primer and two coats of best quality painting paint, reinforced with retro reflective sheeting as per item M.O.S.T. Specifications, 3.1m long stand post and frame fabricated from suitable section angle of 35 x 35 x 3mm/2mm/5mm as required, painted with best quality epoxy painting in black and white, the details of symbols for backward that details of symbols for each side shall be as per the instruction of engineer in charge. The fixing of the sign shall be in 3/4" C.C. block of size 45 x 45 x 60cm, for each leg, including excavation, casting, etc. complete under the supervision of engineer in charge (As Engineer Grade IV)							0.00	1,854.30	0.00		1,854.30	
36	Providing parapet of ordinary cement concrete M-200 as per detailed drawings with necessary reinforcement including, shuttering, laying, vibrating and finishing to line and level complete (20' Cast in situ).	0.00	1,073.64	0.00								1,073.64	
37	Construction of granular sub base with Coarse Graded Material (G.M.S) (Table: 402-2 of 100 mm) for providing coarse graded material (G.M.S) having size: 5.0mm to 26.5 mm @ 27.5%, 26.5 mm to 4.75 mm @ 22.5%, 4.75mm to 0.75mm @ 12.50%, and 0.75mm below @ 37.5% spreading in uniform layers with including and mixing the material obtained from cutting & filling road bed with machine using motor grader or prepared surface mixing by mix or place method with vibrator at DMC and compacting with vibratory roller to achieve the desired density complete as per Clause 402.3 Table 402.3.				140.45	1,013.94	142,478.17					1,013.94	
38	Providing and fixing joint and pipe railing as per detailed drawing including 4 coats of painting in steel areas complete.	134.45	1,304.11	175,851.73								1,304.11	
39	Overturn: Providing temporary diversion suitable for traffic during the construction period of the C.D. structure work by leveling existing ground and constructing suitable compacted subgrade, road surface with providing layers & consolidation of 200 mm W.B.M. in layers as cartilage with safety measures like sign board, guard stone & maintain for motorable road throughout construction period etc. and also dismantle diversion after completion of work etc. complete as per instruction of engineer in charge										50.00	2484.6	124,230.00
40	Providing and casting in situ controlled cement concrete M-25 for R.C.C. solid slab including shuttering, scaffolding, curing and finishing complete										12.50	5,354.06	118,181.35
41	Providing and casting in situ controlled cement concrete M-25 for approach slab including formwork, curing and finishing complete										34.10	5,275.67	84,294.29
42	Providing and casting in situ controlled cement concrete M-25 for kerbs/side blocks including formwork, curing and finishing complete										1.70	4,948.59	8,412.60
43	Providing and casting in situ ordinary cement concrete M-20 and providing necessary girths, including shuttering, scaffolding, laying, vibrating, curing and finishing complete with 4-drains (A) height from 0.8m to 5.0m										95.36	4,291.68	408,997.30
44	Providing and laying in position in 500/100 D.C.B. TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following (A) Solid Slab / Approach / Winging Curb										8.70	76,778.21	667,988.89
45	Providing 20mm thick pre-molded asphalt filler joints as per drawings										7.00	788.62	5,520.34
46	Providing P.V.C. hollow diameter water spigots including necessary formwork as per drawings										1.00	138.36	1,812.82
47	Providing and fixing of precast R.C.C. railing of M-30 Grade Concrete having 2 line (flow) of hand rail dimensions as shown in detail drawing & Vertical Post such as c/c facing between vertical posts not to exceed 1.625m including necessary TMT steel, formwork, painting with weatherproof paint etc.										30.00	1,347.26	40,417.80
48	Earthwork for embankment including breaking clod, dressing with all ball and 1/4 (including watering & consolidation). (I) From borrow area within 5.00 km										331.00	210.88	70,000.12
49	Consolidating the existing structure including removing and starting the dismantled material at and where directed R.C.C. work										36.00	1912.25	68,841.00
50	Consolidation and disposal of unsuitable material with all lift and load (II) Consolidated Concrete										333.00	628.81	20,940.12

Kasimganj-Mughjan-Dewara road 13/400 to 15/500										Total for Quantity total of 1/400 - 1/500			
Sl. No.	Item of work	Section 2: Approach & Road works			Section 3: Bridge Works			Section 2: Approach & Road Works			Total for Quantity total of 1/400 - 1/500		
		Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.
35	Reinforcement for providing and fixing work in Progress sign boards made of 2mm aluminium sheet size 80 x 40cm, rectangles as per the design of IRC-67-1977 pre-treated with phosphating process & acid-lacking coated with one coat of primer and two coats of last quality epoxy paint, reflective with retro reflective sheeting as per IS: 8001, M.O.I.I. Specifications, 3.1m long sheet postcard frame fabricated from suitable dimension angle of 35 x 35 x 3mm/25x25mm as required, painted with two anti-rust epoxy coatings in black and white, the details of symbol for one-lane road shall be as per the instruction manual of the Indian Road Congress. The fixing of sign shall be in 1:2 x 1/2 block of size 40 x 40cm, for each leg, including excavation, casting, etc. complete under the supervision of engineer in charge. (As per Engineer's Guide 504)	2.00	3,856.90	7,713.80				2.00	3,856.90	7,713.80			1,856.00
36	Providing parapet of ordinary cast-in-place concrete M-200 as per detailed drawings with necessary reinforcement including, shuttering, laying abutting and finishing to line and level complete. (As per IS: 462)												
37	Construction of granular Sub-base with Coarse Graded Material (Grade II) (Table: 400-2) of 100 mm by providing double graded material Metal Crushed size 30mm to 4.75mm (92.5% to 27.5%), 24.5 mm to 9.5 mm (22.5% to 77.5%) (92.5% to 4.75mm) (92.5% to 4.75mm) below @ 17.5% spreading in uniform layers with including and mixing the material obtained from cutting RT road by rolling machine using motor grader on prepared surface mixing by mix to place method with vibrator at CMC and compacting with vibratory roller to achieve the desired density complete as per Clause 401.2 Table 400.1.				50.00	2,444.60	1,22,230.00						
38	Providing and fixing joint and joint rolling as per detailed drawing including a coat of painting to total works complete.												
39	Direction: Providing temporary diversion suitable for traffic during the construction period of the C.D. structure work by leveling existing ground and constructing suitable compacted embankment, road surface with providing, laying & consolidation of 200 mm WBM in layers on carriage with safety measures like sign board, guard stone & maintain for motorable road throughout construction period etc. and also dismantle diversion after completion of work etc. complete as per instruction of engineer in charge												
40	Providing and setting in situ controlled concrete M-25 for R.C.C. side slab including centering, scaffolding, curing and finishing complete				13.40	3,254.06	43,611.20						
41	Providing and setting in situ controlled concrete M-25 for approach slab including formwork, curing and finishing complete				18.30	5,135.17	93,973.03						
42	Providing and setting in situ controlled concrete M-25 for kerbs/curbs including formwork, curing and finishing complete				11.80	4,548.56	53,673.78						
43	Providing and setting in situ ordinary concrete M-20 mix and providing necessary pin, head, including shuttering, scaffolding, laying, vibrating, curing and finishing complete with V-Groove (A) Height from 0.6m to 1.5m				49.10	4,791.60	235,271.69						
44	Providing and laying in position for 350/350 @ 600 TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following (A) Solid Slab / Approach Slab / Kerb / Curb				6.12	76,778.01	469,881.62						
45	Providing 20mm thick pre-meshed asphalt filter fabric as per drawings	1.00	76,778.01	76,778.01									
46	Providing P.V.C. 100mm diameter water sumps including necessary iron grating as per drawings				6.00	769.62	4,617.72						
47	Providing & fixing of precast R.C.C. of 100 Grade Concrete having 2 - 12mm (10mm) of Hard Hat dimensions as shown in detail drawing & Vertical Part such as G.C. piling between vertical joints not to exceed 1.825m including necessary TMT steel, formwork, painting with weatherproof paint etc.				4.30	159.30	687.60						
48	Earthwork for embankment including breaking clods, dressing with all load and 10% (including watering & consolidation). (E) From borrow area within 5.00 km				36.00	2,147.16	77,300.00						
49	Demarcating the existing structures including removing and stacking the dismantled materials as and where directed R.C.C. work												
50	Demarcation and disposal of unserviceable material with all lift and load (D) Overlaid Concrete	233.00	210.68	49,089.44				104.00	210.68	21,910.72			

Contract to Ghamsila road ch.1/2000 - 1/300							Contract to Ghamsila road ch.0/400 - 0/900	
Sr. No.	Item of work	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	
35	Informative Sign - Providing and fixing Work in Progress sign boards made out of 2mm aluminium sheet; size 60 x 60cm, rectangle as per the design of IRC-43 (1977) per treated with phosphoric process & acid testing, coated with one coat of epoxy primer and two coats of best quality epoxy paint, effectuated with retro reflective sheeting as per latest M.O.S.T Specifications; 3.1m long stand post and frame fabricated from suitable galvanized coatings in black and whiteboards, the details of symbol for one-board oval details of symbol for each board shall be as per the instruction of engineer in charge. The fixing at site shall be in 1:2.4 CC block of size 45 x 45cm. for each leg. including excavation curing, tax, complete under the supervision of engineer in charge. (As Engineer's Certificate)	1.00	3,875.00	3,875.00	1.00	3,875.00	3,875.00	
36	Providing, pouring of ordinary cement concrete M-200 as per attached drawings with necessary reinforcement including, shuttering, laying, vibrating and finishing to line and level complete (U) Curb in situ.							
37	Construction of granular Sub base with Coarse Graded Material (Grades 1) (Table: 400-2) of 150 mm by providing coarse graded material (Moisture Content: 15.5% to 26.5% max @ 27.5% 26.5 mm to 3.5 mm @ 22.5%, 5.5% to 4.75mm @ 12.50% and 4.75mm below @ 9.75% spreading in uniform layers with including and mixing the material obtained from cutting RT road by rolling machine using roller greater in prepared surface mixing by one in place method with vibrator at 0.4m and compacting with vibratory roller to achieve the desired density complete as per Clause 403.1.1 Item 400-1.							
38	Providing and fixing post and pipe railing as per detailed drawing including costs of painting to steel works complete.							
39	Division: Providing temporary diversion suitable for traffic during the construction period of the C.I. structure work by leveling existing ground and constructing suitable compacted embankment, road surface with providing layer & consolidation of 200 mm WBM in layers in suitable width with safety measures like sign board, guard stone & railings for motorable road throughout construction period etc. and also dismantle diversion after completion of work etc. complete as per instruction of engineer in charge							
40	Providing and casting in situ Controlled Cement Concrete M-25 for R.C.C. side slab including centering, scaffolding, curing and finishing complete.							
41	Providing and casting in situ controlled cement concrete M-25 for approach slab including formwork curing and finishing complete							
42	Providing and casting in situ controlled cement concrete M-25 for kerbs/curbs blocks including formwork, curing and finishing complete							
43	Providing & casting in situ ordinary cement concrete M-20 via and providing necessary pin headers including shuttering, scaffolding, laying, vibrating, curing and finishing complete with V-Grooves (A) Height from 0.8m to 1.0m							
44	Providing and laying in position for S50/S50 D 100 TMT bar reinforcement including cutting, bending, loading and tying complete as per detailed drawings by the following: (A) Solid slab / App slab / Wearing Coat							
45	Providing 32mm thick pre-mixed asphalt blue joints as per drawings							
46	Providing P.V.C. 100mm diameter water service including necessary iron fittings as per drawings							
47	Providing & fixing of precast & C.C. railing of M-20 Grade Concrete having 2-16 (16mm) of steel bar dimensions as shown in detail drawing & vertical post with 10 x 10 x 10mm vertical joints not to exceed 1.625m including necessary TMT stand, formwork, painting with waterproof paint etc.							
48	Earthwork for embankment including breaking down, dressing with at least 100 mm (100mm) of water & consolidation (10) From known area within 5.00 km head							
49	Shoring and the setting structures including retaining and shoring the excavated material as and where directed RCC work							
50	Removal and disposal of unserviceable material with all lift and load (10) Unperformed Concrete							

Druidist to Quantilla road th 17/200 - 0/200						TOTAL		
Sr. No.	Item of work	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	
35	Intermediary Sign: Providing and fixing Work in Progress sign boards made out of 2mm aluminium sheet, size 85 x 60cm, rectangular as per the design of IRC-43-1977 put treated with aliphatic primary & acid finishing, coated with one coat of appropriate and two coats of best quality epoxy paint, reflectorized with retro reflective sheeting as per latest: M.O.S.T Specifications, 3.1m long stand, postcard frame fabricated from suitable material angle of 25 x 25 x 3mm/2x2x2mm as required, painted with best quality epoxy coatings in black and white colors, the details of symbol for each condition shall be as per the instruction book as per the instruction book. The font at site shall be in 1.2-1.4 CE block of size 40 x 40 x 60mm, for each leg. Including excavation casting, etc. complete under the supervision of engineer in charge (M Engineer Grade/PM)	1.00	3,856.80	3,856.80	12.00	1,854.90	46,241.80	
36	Providing and casting in situ controlled concrete M-25 for R.C.C solid side including cementing, scaffolding, curing and finishing complete				211.89	1,663.44	272,729.48	
37	Construction of granular Sub base with Coarse Graded Material (Grade II) (Table-400-2) of 100 mm by providing course graded material (Material Graded) using size 5/20mm @ 27.5%, 26.5 mm to 8.5 mm @ 22.5%, 9.5mm to 4.75mm @ 12.50%, and 4.75mm below @ 37.5% spreading in uniform layers with including and mixing the material obtained from cutting RT road by rolling machine using roller grader in prepared surface raising by mix in place method with vibrator at 0.4m and compacting with vibratory roller to achieve the desired density complete as per Clause 401.2 Table 400.1.							
38	Providing and casting in situ controlled concrete M-25 for R.C.C solid side including cementing, scaffolding, curing and finishing complete				124.45	1,204.11	149,851.73	
39	Providing and casting in situ controlled concrete M-25 for approach slab including cementing, scaffolding, curing and finishing complete				100.00	2,488.00	248,800.00	
40	Providing and casting in situ controlled concrete M-25 for R.C.C solid side including cementing, scaffolding, curing and finishing complete				15.00	8,256.00	123,840.00	
41	Providing and casting in situ controlled concrete M-25 for approach slab including cementing, scaffolding, curing and finishing complete				34.80	5,233.87	182,207.32	
42	Providing and casting in situ controlled concrete M-25 for kerbs/kerbs blocks including cementing, scaffolding, curing and finishing complete				2.80	4,948.59	13,866.13	
43	Providing and casting in situ ordinary concrete M-20 and providing necessary reinforcement including: scaffolding, curing, vibrating and finishing complete with V-Grooves (A) Height from 0.0m to 5.0m				144.40	4,291.68	619,718.56	
44	Providing and casting in situ ordinary concrete M-20 and providing necessary reinforcement including: scaffolding, curing, vibrating and finishing complete with V-Grooves (A) Height from 0.0m to 5.0m				17.82	16,778.01	1,348,184.14	
45	Providing 20mm thick precast concrete slabs with joints as per drawings including casting, bending, blocking and tying complete as per detailed drawings for the following: (A) Solid Slab / Any Slab / Working Coat				13.00	769.47	10,003.10	
46	Providing P.V.C 100mm diameter sewer joints including necessary reinforcement as per drawings				18.00	138.36	2,490.76	
47	Providing and casting of precast R.C.C. of M-30 Grade Concrete having 2.5% (Bov) of Hand Rail dimensions as shown in detail drawing & Vertical Post such as: (i) piling between vertical posts not to exceed 1.625m including necessary 10mm steel reinforcement, painting with weatherproof paint etc.				38.00	2,347.26	120,248.56	
48	Earthwork for embankment including breaking clods, dressing with all hand and 1st (including watering & consolidation) (C) From borrow area within 5.00 km lead				488.00	210.88	98,598.24	
49	Demolishing the existing structures including removing and stacking the materials as and where directed BCC work				84.00	930.75	13,492.60	
50	Demolition and disposal of unserviceable material with all lift and load (B) Unserviceable Concrete				113.00	623.01	70,400.13	

[illegible]

Drunkard to Ghantilla road ch 1/200 - 1/300							Drunkard to Ghantilla road ch 0/400 - 0/500	
Sr. No.	Item of work	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	
31.	Removal of all types of frame joints and slacking within a head of 1200mm including Earthwork and dismantling of masonry works as per Technical Specification clause 102 (Rate Analysis) (B) Above 800mm to 1500mm old frame plans	7.50	429.01	3,217.56	15.00	419.01	6,285.15	
32.	Providing and applying one coat epoxy phenolic primer of 100 to 150 micron and two coats of polyurethane (polyurethane) epoxy paint 75 micron DFT each or any other equivalent epoxy coating system to all concrete surfaces exposed to atmosphere in Substructure & Super Structures as directed by Engineer and as per specification (B.A.)							
33.	Providing and casting in situ controlled jointed concrete M-25 for R.C.C. and sand on-off walls including necessary vertical pin headers, tie, framework, vibrating, curing and casting complete							
34.	Bulling and wetting of earthworks in layers with alternate tiller including filling in depressions which occur during the process as directed							
35.	Providing and casting in situ ordinary cement concrete M-15 mm and providing necessary pin headers including shuttering, scaffolding, laying, vibrating, rolling and finishing complete without V-Grooves (B) Height from 0.0m to 1.5m	83.00	3,023.64	247,088.52	77.00	3,023.64	232,820.08	
36.	Providing and fixing "W" type metal beam crash safety barrier comprising of single row 3 mm thick galvanised sheet to be fixed on ISMC 150 (150 mm x 75 mm x 4.5 mm) series channel vertical post to be spaced 2.0 mtr c/c to be fixed 1.85 mtr height including necessary foundation, fixing with bolts, painting, padlock, indication, posts on W beam and required all process as per specification and as per drawing							
37.	Supplying & laying of 6-mm extruded high modulus polypropylene geogrid conforming to MORTH specification for base/sub-base reinforcement having minimum tensile strength 300N/m ² in the longitudinal and transverse direction, junction efficiency not less than 95% and with 30mm x 30mm mesh spacing							
38.	Road marking with hot applied thermoplastic paint (Yellow color no. 330 on C.C. road & white colour on asphalt surfaced) with reflecting glass beads on bottom surface providing and laying a hot applied thermoplastic composition 2.5mm thick including reflecting glass beads @250 gms per sqm area thickness of 2.5mm is excluding of surface applied glass beads as per IRC: 81-2013. The finished surface to be level, uniform and free from streaks, and holes. 2000 gms/pack/parts level/ center line / edge line / cut parts. The white color marking should provide luminance coefficient of tangent road shall be min 130 mcd/m ² /lx and applied road shall be min 150 mcd/m ² /lx during the service life during the day time. The marking should meet the performance criteria for night time reflectivity, wet reflectivity and skid resistance as mentioned in the section 15 of IRC: 81-2015. Warranty for the paint reflectivity should be two years							
39.	Cut back road stud/ pin : Supplying of moulded twin shank raised pavement markers made of polycarbonate and ABS moulded body and reflective passive with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 13050 kg/ stud in accordance to ASTM D-4380 type II and conforming to specifications of category A of MORTH circular no 89/96/2023/10-97 dt 01.01.2006.1997 The height, width and length shall not exceed 20mm, 130mm and 130mm and with minimum reflective area of 13 sqm on each side and the depth to the base shall be 35 +/- 5 degree. The strength of detachment of the raised pavement markers, (of diameter not less than 10 +/- 2 mm and height not less than 30 +/- 2 mm) from the body to be a minimum value 500 kgf. Filling will be by drilling holes on the road for the studs to go inside, without nails and using epoxy resin based adhesive as per manufacturer recommendation and The color of the marker should be as per the IRC: 81-2015 and as directed by Engineer in charge							

Dhukut to Ghambila road ch 0/200 - 0/300							TOTAL		
Sl. No.	Item of work	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Amount in Rs.
51	Restoring all types of stone pipes and standing within a lead of 100m including Earthwork and dismantling of masonry work under Technical Specification clause 202 (Rate Analysis) (5) Allow 100mm to 150mm for extra pipes.	33.00	413.81	13,655.73	97.50	410.01	40,176.00		40,176.00
52	Providing and applying one coat epoxy provides primer of 100-150 micron and two coats of polyurethane (epoxy) epoxy paint/75 micron 200 each or any other equivalent epoxy coating system to all concrete surfaces exposed to atmosphere in Substructure & Super Structure as directed by Engineer and as per specification (15.3)				783.00	233.21	182,603.81		182,603.81
53	Providing and casting in situ reinforced concrete concrete M-20 for R.C.C. slab and 100 mm wide including necessary vertical joint headers 100% formwork, strutting, bracing and curing compound				55.70	4,897.26	270,867.43		270,867.43
54	Grouting and widening of earthworks in layers with vibratory roller including filling in depressions which occur during the process in directed.				468.00	22.95	10,740.60		10,740.60
55	Providing and casting in situ ordinary concrete concrete M-15 mix and providing necessary joint headers including strutting, scaffolding, laying strutting, curing and finishing complete without V-Grooves. (A) Height from 1.5m to 3.0m.	71.00	1,581.84	112,390.64	43.00	3,823.84	164,633.92		164,633.92
56	Providing and fixing "60" type metal beam crash safety barrier consisting of single row 2 mm thick galvanized sheet to be fixed on 100x125 (110 mm x 75 mm x 5.4 mm) pipes spaced vertical post to be spaced 2.0 m c/c to be kept 1.65 m height including necessary foundation, fixing with bolts, painting, medium indication posts on W-beam and required all process as per specification and as per drawings				80.00	3,854.20	308,336.00		308,336.00
57	Supplying & laying of 10mm thick high modulus polypropylene geogrid conforming to MORTH specification for base/sub-base reinforcement having minimum tensile strength 3000N/m ² in the longitudinal and transverse direction, junction efficiency not less than 95% and with fibers 3 fibers mesh spacing.				221.50	353.51	78,288.49		78,288.49
58	Road marking with hot applied thermoplastic paint (Yellow color 100 g/l of C.C. road & white color on asphalt surface) with reflecting glass beads on 2.5mm thick including reflecting glass beads @250 gms per sqm area. Thickness of 2.5mm is including of surface applied glass beads as per IRC: 263-2013. The finished surface to be level, uniform and free from streaks and holes. 200mm thick/200mm wide/ center line / edge line / cut path. The white color marking should provide minimum coefficient of contrast road shall be min 130 mcd/m ² and night road shall be min 100 mcd/m ² during the service life during the day time. The marking should meet the performance criteria for night line reflectivity, wet reflectivity and skid resistance as mentioned in the section 15 of IRC: 263-2013. Warranty for the road marking should be for two years.				38.00	307.72	11,693.36		11,693.36
59	Cast Road/road stud type : Supplying of moulded twin channel pavement markers made of polycarbonate and ABS moulded body and reflective panels with retro-reflective lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 13000 kg tested in accordance to ASTM D 4260 type II and complying to specifications of category A of MORTH under no 300/100/100/100/100 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16 D17 D18 D19 D20 D21 D22 D23 D24 D25 D26 D27 D28 D29 D30 D31 D32 D33 D34 D35 D36 D37 D38 D39 D40 D41 D42 D43 D44 D45 D46 D47 D48 D49 D50 D51 D52 D53 D54 D55 D56 D57 D58 D59 D60 D61 D62 D63 D64 D65 D66 D67 D68 D69 D70 D71 D72 D73 D74 D75 D76 D77 D78 D79 D80 D81 D82 D83 D84 D85 D86 D87 D88 D89 D90 D91 D92 D93 D94 D95 D96 D97 D98 D99 D100 D101 D102 D103 D104 D105 D106 D107 D108 D109 D110 D111 D112 D113 D114 D115 D116 D117 D118 D119 D120 D121 D122 D123 D124 D125 D126 D127 D128 D129 D130 D131 D132 D133 D134 D135 D136 D137 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D938 D939 D940 D941 D942 D943 D944 D945 D946 D947 D948 D949 D950 D951 D952 D953 D954 D955 D956 D957 D958 D959 D960 D961 D962 D963 D964 D965 D966 D967 D968 D969 D970 D971 D972 D973 D974 D975 D976 D977 D978 D979 D980 D981 D982 D983 D984 D985 D986 D987 D988 D989 D990 D991 D992 D993 D994 D995 D996 D997 D998 D999	38.00	307.72	11,693.36					11,693.36
	Engineer in charge				38.00	307.72	11,693.36		11,693.36

KANTIPUR BAGATHDA ROAD, DIST. MORBI

Sr. No.	Item of work	Section 1: Bridge Works			Section 2: Approach & Road Works			Section 3: Driveway works			Section 4: Bridge Works		
		Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.
60	Install marker sign: Providing and fixing Work in Progress sign board made out of 2mm aluminium sheet, size 90 x 30 cms. rectangular as per the design of IRC-67/1977 per treated with phosphating process & anticorrosive, coated with one coat of epoxy primer and two coats of best quality epoxy paint. Reflected with retro reflective sheeting as per latest M.O.T. specifications; 3.1m long stand installed frame fabricated from suitable stainless steel of 35 x 35 x 3 mm & 50x50x5mm, painted with best quality epoxy coatings. The fixing at site shall be in 1:2.4 CC block of size 40 x 40 cms. for each leg including excavation curing etc. complete under the supervision of engineer in charge. (A) Engineer Grade (B)											2,428.76	
61	Cautionary warning sign: Providing and fixing Work in Progress sign board made out of 2mm aluminium sheet, size 90 x 90 cms. equilateral triangle as per the design of IRC-67/1977 per treated with phosphating process & anticorrosive, coated with one coat of epoxy primer and two coats of best quality epoxy paint. Reflected with retro reflective sheeting as per latest M.O.T. specifications; 3.1m long stand installed frame fabricated from suitable stainless steel of 35 x 35 x 3 mm & 50x50x5mm, painted with best quality epoxy coatings. The fixing at site shall be in 1:2.4 CC block of size 40 x 40 cms. for each leg including excavation curing etc. complete under the supervision of engineer in charge. (A) Engineer Grade (B)											5,808.60	
62	Filling available excavated earth (including road) in trenches, pits, sides of foundations etc. in layers not exceeding 20 cm in depth consolidating each layer by ramming and watering.											116.95	
63	Demolishing the existing structures including removing and stacking the dismantled materials at and others directed being Masonry											469.22	
64	Excavation for foundation up to 1.5m depth incl. Sorting out & stacking of excavated materials & disposing off the excavated stuff up to 50m lead (C) Head Mason											432.61	
65	Providing and laying in position (R 300/550) TMT bar reinforcement including cutting, bending, stacking and tying complete as per detailed drawings for the following: (A) Piers (B) Abutments (C) R.C.C. Returns & walls/caps/curbs											71,808.60	
66	Providing and laying in position (R 300/550) TMT bar reinforcement including cutting, bending, stacking and tying complete as per detailed drawings for the following: (A) R.C.C. kerb (B) R.C.C. fullwidth (C) R.C.C. Approach Slab (D) Working Coat											71,343.20	
67	Providing and casting in situ ordinary concrete concrete M-20 for various thickness wearing coat laid as directed including lumping, vibrating, finishing and filling joints with bitumen concrete												
68	Overturn: Providing temporary diversion suitable for traffic during the construction period of the C.D. structure work by levelling existing ground and constructing suitable compacted embankment, road surface with providing laying & consolidation of 200 mm W800 in layers on carriage width with safety measures like sign board, guard stone & maintain for reasonable road throughout construction period etc. and also observe diversion after completion of work etc. complete as per instruction of engineer in charge												
69	Supplying and fixing reinforced concrete heavy duty non-pressure pipes with rollers for currents carrying heavy traffic as per IS 458-1993 specifications including setting the pipes in C.M. 1:2 watering and tying (in level or slope) of class M20 of following internal diameters: (a) 1200mm dia.												

Risingpur Nagar Palika

[illegible]

Shulbut to Gharinda road ch 0/400 - 0/500						
Shulbut to Gharinda road ch 1/200 - 1/300						
Shulbut to Gharinda road ch 0/400 - 0/500						
Sr. No.	Item of work	Quantity	Rate	Amount in Rs.	Quantity	Amount in Rs.
60	Install number sign: Providing and fixing Work in Progress sign boards made out of 2mm aluminium sheet, size 90 x 60 cms, rectangle as per the design of RC-43-10177 job treated with phosphating process & acid finishing, coated with one coat of epoxy primer and two coats of best quality epoxy paint, reflective with retro reflective sheeting as per latest M.O.S.T. Specifications; 3.1m long steel painted frame fabricated from suitable section angle of 35 x 35 x 3mm & 56x50x5mm painted with best quality epoxy coatings. The fixing at site shall be in 1:2.4 CC block of size 45 x 45 x 60 cms, for each leg, including excavation during the complete under the supervision of engineer in charge (A) Engineer (Roads/HR)	2.00	2,423.74	4,847.48	2.00	2,423.74
61	Galvanneal warning sign: Providing and fixing Work in Progress sign boards made out of 2mm aluminium sheet, size 90 x 90 x 60 cms, equilateral triangle as per the design of RC-43-10177 job treated with phosphating process & acid finishing, coated with one coat of epoxy primer and two coats of best quality epoxy paint, reflective with very reflective sheeting as per latest M.O.S.T. Specifications; 3.1m long steel painted frame fabricated from suitable section angle of 35 x 35 x 3mm & 75x75x5mm painted with best quality epoxy coatings. The fixing at site shall be in 1:2.4 CC block of size 45 x 45 x 60 cms, for each leg, including excavation during the complete under the supervision of engineer in charge (A) Engineer (Roads/HR)					
62	Providing and laying in position FE 560/5500 TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following: (A) Piers (B) abutments (C) R.C.C. Returns & walls (D) Approach Slab (E) Skirting Wall	48.00	136.91	6,571.68	52.00	136.91
63	Demolishing the existing structures including removing and stacking the dismantled materials at and where directed during Masonry	25.00	409.22	10,230.50	24.00	409.22
64	Excavation for foundation up to 1.5m depth incl. Sorting out & stacking of spoil materials & dumping off the excavated stuff up to 50m level (C) Hard Masonry	48.00	453.62	21,832.56	52.00	453.62
65	Providing and laying in position FE 560/5500 TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following: (A) Piers (B) abutments (C) R.C.C. Returns & walls (D) Approach Slab (E) Skirting Wall	0.34	73,858.89	25,111.97	0.35	73,858.89
66	Providing and laying in position FE 560/5500 TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following: (A) R.C.C. kerbs (B) R.C.C. footpaths (C) R.C.C. Approach Slab (D) Skirting Wall	0.18	73,243.52	13,183.74	0.18	73,243.52
67	Providing and casting in situ ordinary concrete M-20 for various structures wearing and laid as directed including lamping, vibrating, finishing, curing and filling joints with bitumen complete	10.35	4,338.66	44,810.43	10.35	4,338.66
68	Construction period of the C.D. structure work by leveling existing ground and constructing suitable compacted embankment, road surface with providing laying & consolidation of 200 mm WBM in layers on cartilage with with subgrade measures like sign board, guard stone & material for maintain for maintain road throughout construction period etc. and also dismantle diversion after completion of work etc. complete as per instruction of engineer in charge	45.00	1,847.29	83,128.05	50.00	1,847.29
69	Supplying and fixing reinforced concrete heavy duty non pressure pipes with collars for culverts carrying heavy traffic as per IS 498:1982, specifications including setting the pipes in C.M. 1:2 watering and laying the level or slope of the W.P. of following internal diameters (a) 1200mm dia				15.00	5,560.01

CHACHICHECH VERNASAR ROAD, TA MADHYA, DIST MORBI.

Sr. No.	Item of work	Unit	Section 1: Bridge Works			Section 2: Approach & Road Works			Section 3: Diversion works		
			Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.
70	Taking credit for MFI Pipes	Per		₹ -1,515.00							
71	Credit for existing material	Per		₹ -2,072.10							
72	Material taken credit (10% of actual rate analysis)	Per									
73	Carrying and taking Credit for reinforcement in solid slab (10% of cost)	kg		₹ -41.50							
74	10% of basic rate										
75	Credit for Dispersal items										
76	Carrying and taking Credit for Pipe 120mm Dia	Per		₹ -3,041.70							
77	Deduction of 10% credit of useful diameter material of diversion										
					₹ 9,651,027.70						₹ 983,661.82
											₹ 11,026,675.81
											₹ 101,384.20

RAVAMPATI TO SADULARA ROAD, TA MORBI, DIST MORBI.												DHULKOT GHANTELA ROAD, TA			

HALVAD, DIST MYSURU

ONEVANA JIVA ROAD, TA HALVAD, DIST MYSURU

Sl. No.	Item of work	Road Works			Section 3: Diversion works			Section 1: Bridge Works			Section 2: Approach & Road Works			Section 3: Drainage works		
		Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.
70	Taking credit for HPI Paper	45.00	₹ 1,305.44	₹ 58,794.80				0.00	₹ 1,802.44	₹ 0.00				43.00	₹ 1,205.44	₹ 51,824.52
71	Credit for existing material							0.00	₹ 1,872.18	₹ 0.00						
72	Material taken credit below 100% of actual (the analysis)							0.00	₹ 41.55	₹ 0.00						
73	Carrying and taking Credit for reinforcement in solid slab (70kg/cm2)							0.00	₹ 41.55	₹ 0.00						
74	100% of base rate							0.00	₹ 41.55	₹ 0.00						
75	Credit for Unreinforced items							0.00	₹ 41.55	₹ 0.00						
76	Carrying and taking Credit for 100mm Dia							0.00	₹ 41.55	₹ 0.00						
77	Reduction of 10% credit of useful drainage material of diversion							0.00	₹ 41.55	₹ 0.00						
		₹ 262,355.70			₹ 241,675.37			₹ 22,709,693.74			₹ 495,254.92			₹ 228,708.45		
		₹ 262,355.70			₹ 241,675.37			₹ 22,709,693.74			₹ 495,254.92			₹ 228,708.45		
		₹ 262,355.70			₹ 241,675.37			₹ 22,709,693.74			₹ 495,254.92			₹ 228,708.45		

KANTIPUR SAGATHDA ROAD, DIST MORANG

Sr. No	Item of work	Section 1: Bridge works			Section 2: Approach & Road Works			Section 3: Diversion works			Section 4: Bridge Works		
		Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.
70	Taking credit for 10% Pigeon	0.00	₹ 1,800.44	0.00									
71	Credit for existing material	0.00	₹ 3,272.84	0.00									
72	Metal beams (with 120% of actual rate analysis)												
73	Casting and taking credit for reinforcement in solid slab (170kg/cum)	0.00	₹ 41.50	0.00									
74	100% of 100% rate												
75	Credit for Disembarked items												
76	Casting and taking credit for 120% items (100)	0.00	3,000.70	0.00									
77	Subtraction of 70% credit of actual disburse material of diversion												
				₹ 15,078,398.10									
													₹ 0.00
													₹ 2,446,887.57
													₹ 4,055

are road 1/100 to 1/200									
Masangar Maghar-Gelara road 15/400 to 15/200									
Dhukut to Chantia road ch 1/400 - 1/500									
Sr No	Item of work	Section 2: Approach & Road Works			Section 3: Bridge Works			Section 4: Approach & Road Works	
		Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.	Quantity	Rate
70	Traking credit for 4/21 Poles								
71	Credit for setting material								
72	Model beam crash test (10% of actual rate analysis)								
73	Casting and setting Credit for reinforcement in solid slab (70kg/cum)								
74	Credit for basic rate								
75	Credit for identified items								
76	Casting and setting Credit for 1.500mm dia								
77	Substitution of 10% credit of actual concrete material of dimension								
		863.94		₹ 1,408,996.36			₹ 1,339,282.25		₹ 658,861.10
							₹ 2,198,154.35		₹ 581,166.97

Drushat to Garantia road ch 1/200 - 1/300						Drushat to Garantia road ch 0/400 - 0/500					
Sr. No		Name of work	Quantity	Rate	Amount in Rs.	Quantity	Rate	Amount in Rs.			
70		Taking credit for 1073 Pipes									
71		Credit for existing material									
		Material taken 100% better 100% of actual rate analysis									
72		Carrying and taking Credit for performance in solid job (Pkg. cost)									
		10% of base rate									
73		Credit for Dispersed areas									
74		Carrying and taking Credit for Pipe 1200mm dia									
75		Reduction of 70% credit of useful diameter instead of diameter									
					₹ 583,278.97						₹ 665,727.04
					₹ 583,278.97						₹ 665,727.04

Tender to Chavilla road ch 0/200 - 0/300					
TOTAL					
Sr. Item	Item of work	Quantity	Rate	Amount in Rs.	Amount in Rs.
70	Taking credit for H.P. Pipes	90.00	Rs. 1,800.00	Rs. 162,000.00	Rs. 162,000.00
71	Credit for existing material				
	Special item credit items (10% of actual rate analysis)	50.00	Rs. 1,072.16	Rs. 53,608.32	Rs. 53,608.32
72	Certing and taking credit for reinforcement in solid slab (70kg/cm ²)				
	10% of basic rate	3,207.48	Rs. 40.55	Rs. 130,194.87	Rs. 130,194.87
73	Credit for Diversified Items				
74	Certing and taking credit for Page 120 item 10a	1.00	Rs. 7,238.00	Rs. 7,238.00	Rs. 7,238.00
75	Deduction of 20% (table of work) (transport material of diversion)	80.00	Rs. 1,001.73	Rs. 80,138.73	Rs. 80,138.73
		3.00	Rs. 173,822.83	Rs. 521,372.25	Rs. 521,372.25
				Rs. 665,195.04	Rs. 665,195.04
				Rs. 665,195.04	Rs. 665,195.04

Total Quid Item	Rs. 75,809,181
Add Contingency Charges	Rs. 782,004
Add 1% Q.C. Charges	Rs. 782,004
Add Consultants services	Rs. 2,112,229
GST	Rs. 11,835,205
Grand total including GST	Rs. 81,276,733
Amount as per TS	Rs. 81,286,730
Round off Difference	9,997

CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN MORBI DISTRICT - PACKAGE -2

**SCHEDULE – B
QUANTITY STATEMENT**

It. No.	Item of Work	Quantities estimated out or less	Unit	Rate	Amount
				In Figure	
1	2	3	4	5	6
1	Demolition including stacking of serviceable materials and disposal of unserviceable materials with all lead and lift. (i) R.C.C. work	681.2	Cum	1062.35	723,721.04
2	Excavation for foundation in sand, gravel, clay soft soils and murrum etc. including shoring, strutting dewatering as necessary and disposing of the excavated stuff as directed. (A) Depth upto 3.0 M. and lead upto 100m for 10 Cum	5215.9	Cum	511.11	2,665,909.90
3	Providing and laying plain cement concrete in levelling course complete as per drawings and technical specifications as per sections 1500, 1700 and 2100 of MORTH. (M-15)	788.7	Cum	3764.33	2,968,910.80
4	Providing and laying plain cement concrete grade M-15 PCC Toe wall for toe protection i.e. to prevent the slope pitching from sliding down, with graded machine mixed stone aggregate from 6 mm to 40 mm including tamping, vibrating, leveling and curing complete with all formwork, dewatering wherever required including all materials, labours, plants, machineries & tools, all leads and lifts, etc. complete as per specification.	369.6	Cum	3772.18	1,394,189.79
5	Providing and fixing in position (Thermo mechanically Treated bars) TMT Fe550D CRS conforming to IS 1786 reinforcing bars of various diameters for Box structure, retaining wall, etc. as per detailed designs and drawings and schedule including cutting, bending, hooking the bars, binding with 18 SWG GI wires with cost of all labour, materials, tools, plants, equipments, supporting as required with all lifts and leads etc. all complete as per specification and as directed by Engineer The rate includes for supply, loading, unloading, transporting to site, cutting, bending, lap length, hooking, placing, tying in position with contractor's own binding wire, welding, forming the cage and lowering it in position in pile bore etc. Welding and supporting in position to ensure lines and levels during concreting, maintaining proper cover/ spacing, all leads & lifts, etc. including contractor's own equipment, labour, supervisor, taxes, machineries, etc. complete as per drawings and specification.	309.6	MT	77471.35	23,981,484.13

It. No.	Item of Work	Quantities estimated out or less	Unit	Rate	Amount
				In Figure	
1	2	3	4	5	6
6	Providing and casting in situ controlled cement concrete M-25 for R.C.C. box structure, as per drawings, Stem of Retaining wall etc. using 6 mm to 20 mm machine crushed well graded stone aggregate, sand of approved quality, OPC 53 grade cement with contractor's own concrete mix design etc. complete as per specification. The rate is inclusive of all materials, including necessary mixing in fully automatic batch mix plant, transport, curing, vibrating, placing in position, scaffolding, staging, normal shuttering, formworks, deshuttering carefully, making good the damages, fixing embedment, inserts, pockets, wherever necessary, with all lead and lift with contractor's labour, tools & plants, machineries, as required, with including cost of fair finish form work.	3394.2	Cum	5304.31	18,004,043.51
7	Providing and laying - Filter Media 600mm thick directed at the back of abutments, returns and wing walls as per detailed specifications.	900.9	Sqm	1233.39	1,111,168.30
8	Providing & laying weep hole in Abutments, and returns by using A.C. pipe of 100mm including laying in proper grade and jointing the completed as per detailed specification.	918.0	Nos.	119.08	109,317.07
9	Back filling behind Abutment, wing wall and return wall with selected granular material of approved quality including all the materials, compacting, labour, equipment charges, etc all complete as per drawing and Technical Specification Section 300 (Percentage of fine content maximum 15%, Backfill soil phi 30°, Density 20 kN/m³, Field compaction 95±2% modified proctor density).	2183.6	Cum	504.42	1,101,467.75
10	Providing and laying rubble for apron (each stone weighting not less than 40Kg.) including and packing and filling in the interstices with quarry-spalls. For Rigid Apron.	646.9	Cum	1083.81	701,164.89
11	Providing and laying plain cement concrete grade M-20 curtain wall with minimum depth below floor level of 2m on upstream and 2.5m on downstream side as per clause 20.1.2.3 of IRCSP:13-2004 and section 2507.1 of MORTH specification.	789.1	Cum	4591.53	3,623,383.04
12	Providing and laying rubble for apron (each stone weighting not less than 40Kg.) including and packing and filling in the interstices with quarry-spalls. For Flexible Apron.	694.4	Cum	1083.81	752,604.99
13	Providing and laying Filter material underneath pitching in slopes 300mm thick complete as per drawing and Technical specification.	194.1	Sqm	309.84	60,127.26
14	Providing and laying Pitching on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical specifications.	58.2	Cum	1136.59	66,170.37

It. No.	Item of Work	Quantities estimated out or less	Unit	Rate	Amount
				In Figure	
1	2	3	4	5	6
15	Providing and casting in situ controlled cement concrete M-25 for Parapet Wall, as per drawings. Stem of Parapet wall etc. using 6 mm to 20 mm machine crushed well graded stone aggregate, sand of approved quality, OPC 53 grade cement with contractor's own concrete mix design etc. complete as per specification.	98.4	Cum	5304.31	521,816.59
16	Providing and casting in situ controlled cement concrete M-30 for average 75 mm thick wearing coat laid as directed including tamping, vibrating, finishing, curing and filling joints with bitumen complete	227.9	Cum	5536.10	1,261,864.69
17	Clearing and grubbing road land including uprooting rank vegetation grass bushes, shrubs, sapling and trees girth up to 300 mm removal of stumps of trees cut earlier and disposal of unserviceable materials (C) By mechanical means in area of light jungle	0.4	Hectare	28434.97	10,520.94
18	Dismantaling of Bituminous Layer	90.2	cum	256.75	23,146.01
19	Dismantaling of Granular Layer	518.4	cum	357.25	185,194.83
20	Earthwork for embankment including breaking clods, dressing with all lead and lift and including watering rolling and consolidation of subgrade in layers at O.M.C. to required dry density including filling the depression which occur during the process using power roller 8T to 10T, (E) From Borrow area within 3.0KM lead.	5826.0	Cum	236.97	1,380,582.06
21	Construction of sub-grade and earthen shoulders using quarry spall with all lead and lift and including watering and rolling and consolidation of sub grade in layers at OMC to required dry density including filling the depressions which occur during the process using power roller 8T to 10 T	1222.0	cum	289.78	354,117.19
22	Construction of granular Sub base with Coarse Graded Material (Grade III) (Table:- 400- 2) of 200 mm by providing coarse graded material Metal Crushed using size 53mm to 26.5 mm @ 27.5%, 26.5 mm to 9.5 mm @ 22.5%, 9.5mm to 4.75mm @12.50% and 4.75mm below @ 37.5% spreading in uniform layers with including and mixing the material obtained from cutting BT road by milling machine using motor grader on prepared surface mixing by mix in place method with rotavator at OMC and compacting with vibratory roller to achieve the desired density complete as per Clause 401.2 Table 400.1 grade-V.	155.3	cum	1111.11	172,578.18

It. No.	Item of Work	Quantities estimated out or less	Unit	Rate	Amount
				In Figure	
1	2	3	4	5	6
23	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.-Grading 1, Using Screening Crushable type such as Moonum or Gravel.	281.5	Cum	1620.00	456,061.11
24	Cement Concrete Pavement (Construction of unreinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, transported to site, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing)	384.0	Cum	5543.87	2,128,845.00
25	Providing and fixing sign boards made out of 2.0 mm aluminium sheet / 4 mm ACP (Aluminum composite Panel); size 90x30 cms. rectangular as per design of IRC-67-2012. Pre treated with phosphating process & acid etching; coated with one coat of epoxy primer and two coats of best quality epoxy paint ;reflectorised with Micro Prismatic Grade retro reflectivesheeting of Type-11 as per ASTM D-4956 and latest M.O.S.T.Specifications; 1.8mtr long stand post of 75 x 75 x 6mm / 65NB Circular MS Pipe as required and frame fabricated from suitable size iron angle of 35 x 35 x 3mm; painted with bestquality epoxy coatings in black and white bends. The details of symbol foreach board shall be as per theinstruction of engineer in charge. The fixing at site shall be in 1:2:4 CC blockof size 45 x 45 x 60 Cms. for each leg.including excavation, curing etc.complete under the supervision of engineer in charge. A warranty for 10 years for the Retro reflective sheeting from original manufacturer & a certified copy of 3 year outdoor exposure test report from third party test lab for the product offered shall be submitted by contractor. (A) Class-C Type-11 Retro Reflective sheeting.	10.0	Nos.	3666.30	36,663.00
26	Supplying and fixing reinforced concrete heavy duty non-pressure pipes with collars for culverts carrying heavy traffic as per IS 458-1991 specifications including setting the pipes in C.M. 1:2 watering and laying (to level or slopes) of class NP3 of following internal daimeters.(v) 900mm dia.	190.0	Rmt	3469.26	659,159.40

It. No.	Item of Work	Quantities estimated out or less	Unit	Rate	Amount
				In Figure	
1	2	3	4	5	6
27	Excavation for foundation in hard murrum and boulders and very stiff or sticky, clays and other similar strata including shoring and strutting and dewatering as necessary and disposing of the excavated stuff as directed .	2520.9	Cum	611.32	1,541,067.35
28	Providing and laying plain cement concrete grade M-20 PCC protection wall, with graded machine mixed stone aggregate from 6 mm to 40 mm including tamping, vibrating, leveling and curing complete with all formwork, dewatering wherever required including all materials, labours, plants, machineries & tools, all leads and lifts, etc. complete as per specification.	227.6	Cum	4142.22	942,562.64
29	Providing MS Flood guage on top of the bridge including supply, fixing and painting complete as directed by engineer in charge	2.0	Nos.	1877.54	3,755.07
30	Excavation in large boulders and soft rock by welding Including shoring, strutting and dewatering as necessary and disposing of the excavated stuff as directed.	341.9	Cum	716.55	244,968.52
31	Providing and laying plain cement concrete in levelling course complete as per drawings and technical specifications as per sections 1500, 1700 and 2100 of MORTH. (M-10)	58.0	Cum	3345.58	194,043.91
32	Diversion sing board :-Providing & Fixing sign boards made out of 2mm aluminium sheet, size 180 x 60 cms. rectangle as per the attached drawing pre treated with phospheting process & acid etching, coated with one coat of epoxy priemr and two coats of best quality epoxy paint reflectorised with retro reflective sheeting as per latest M.O.S.T. Specifications; Letters and numerals should be as per IRC-30-1968,3.1m long (2nos) stand post and frame fabricated from iron angle of 35x35x3mm, 50x50x5mm painted with best quality epoxy coatings in blak and white bends. The fixing at site shall be in 1:2:4 CC block of size 45 x 45x 60cms for each leg, including excavation curing etc. complete under the supervision of engineer in charge.(A) Engineer Grade(VR)	4.0	Nos.	6798.92	27,195.68
33	Granular sub base Grade 1 with black trap crushed stone well graded material (Table-400.1) by mix in place method construction of granular sub base by providing black trap crushed stone well graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC and compacting with vibratory roller to achieve the desired density complete. (As per technical specification clause-401) for Gr-1 Material	26.7	Cum	1116.04	29,820.55

It. No.	Item of Work	Quantities estimated out or less	Unit	Rate	Amount
				In Figure	
1	2	3	4	5	6
34	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.-Grading 2, Using Screening Crushable type such as Moorum or Gravel.	100.5	Cum	1438.17	144,564.68
35	Informatory Signs :-Providing and fixing Work in Progress sign boards made out of 2mm aluminium sheet; size 80 x 60cms. rectangle as per the design of IRC-67-1977 pre treated with phosphating process & acid teching; coated with one coat of epoxyprimer and two coats of best qualityepoxy paint; reflectorised with retro reflective sheeting as per latest M.O.S.T. Specifications; 3.1m long stand postand frame fabricated from suitable sizeiron angle of 35 x 35 x 3mm75x75x6mm as required; painted with best qualityepoxy coatings in black and whitebends. the details of symbol for eachboard shall details of symbol for eachboard shall be as per the instruction ofengineer in charge. The fixing at site shall be in 1:2:4 CC block of size 45 x45 x 60cms. for each leg. including excavation curing tec. complete under the supervision of engineer in charge.(A) Engineer Grade(VR)	12.0	Nos.	3856.90	46,282.80
36	Providing parapet of ordinary cement concrete M-200 as per detailed drawings with necessary reinforcement including, shuttering, laying vibrating and finishing to line and level complete.(ii) Cast in situ.	211.4	Rmt	1053.64	222,729.40
37	Construction of granular Sub base with Coarse Graded Material (Grade II) (Table:- 400- 2) of 100 mm by providing coarse graded material Metal Crushed using size 53mm to 26.5 mm@ 27.5%, 26.5 mm to 9.5 mm @ 22.5%, 9.5mm to 4.75mm @12.50% and 4.75mm below @ 37.5% spreading in uniform layers with including and mixing the material obtained from cutting BT road by milling machine using motor grader on prepared surface mixing by mix in place method with rotavator at DMC and compacting with vibratory roller to achieve the desired density complete as per Clause 401.2 Table 400.1.	189.7	Cum	1013.94	192,355.33
38	Providing and fixing post and pipe railing as per detailed drawing including 3 coats of painting to steel works complete.	124.5	Rmt	1204.11	149,851.73

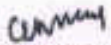
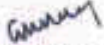
It. No.	Item of Work	Quantities estimated out or less	Unit	Rate	Amount
				In Figure	
1	2	3	4	5	6
39	Diversion: Providing temporary diversion suitable for traffic during the construction period of the C.D. structure work by levelling existing ground and constructing suitable compacted embankment, road surface with providing, laying & consolidation of 200 mm WBM in layers on carriage width with safety measures like sign board, guard stone & maintain for motorable road throughout construction period etc. and also dismantle diversion after completion of work etc. complete as per instruction of engineer in charge	100.0	Rmt	2484.60	248,460.00
40	Providing and casting insitu Controlled Cement Concrete M-25 for R.C.C solid slab including centering, scaffolding, curing and finishing complete	35.9	Cum	5256.06	188,692.55
41	Providing and casting in situ controlled cement concrete M-25 for approach slab including formwork curing and finishing complete	34.8	Cum	5235.67	182,201.32
42	Providing and casting in situ controlled cement concrete M-25 for kerbs/kerb blocks including formwork, curing and finishing complete	2.6	Cum	4948.59	12,866.33
43	Providing & casting-in situ ordinary cement concrete M-20 mix and providing necessary pin headers including shuttering, scaffolding, laying, vibrating, curing and finishing complete with V-Grooves (A) Height from 0.0m to 5.0m	144.4	Cum	4291.68	619,718.59
44	Providing and laying in position Fe 550/550 D CRS TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following: (A) Solid Slab / App slab / Wearing Coat	17.8	MT	76778.01	1,368,184.14
45	Providing 20mm thick pre-moulded asphalt filler joints as per drawings	13.0	Nos.	769.62	10,005.06
46	Providing P.V.C 100mm diameter water sprouts including necessary iron gratings as per drawings	16.0	Nos.	159.36	2,549.76
47	Providing & fixing of of precast R.C.C railing of M-30 Grade Concrete having 2 - tire (Row) of Hand Rail dimensions as shown in detail drawing & Vertical Post such as c/c spacing between vertical posts not to exceed 1.625m including necessary TMT steel, formwork, painting with weatherproof paint etc.	56.0	Rmt	2147.26	120,246.56
48	Earthwork for embankment including breaking clods, dressing with all lead and lift (Excluding watering & consolidation). (E) From borrow area withing 5.00 km lead	468.0	Cum	210.68	98,598.24
49	Dismantalling the existing structures including removing and stacking the dismantled materials as and where directed RCC work	36.0	Cum	930.35	33,492.60
50	Demolition and disposal of unserviceable material with all lift and lead (i) Unreinforced Concrete	113.0	Cum	623.01	70,400.13

It. No.	Item of Work	Quantities estimated out or less	Unit	Rate	Amount
				In Figure	
1	2	3	4	5	6
51	Removing all types of Hume pipes and stacking within a lead of 1000m including Earthwork and dismantling of masonry works as per Technical Specification clause 202 (Rate Analysis) (B) Above 600mm to 900mm dia hume pipes	97.5	Rmt	419.01	40,853.48
52	Providing and applying one coat epoxy phenolic primer of DFT 50 micron and two coats of polyurethane (aliphatic) epoxy paint-75 micron DFT each or any other equivalent epoxy coating system to all concrete surfaces exposed to atmosphere in Substructure & Super Structure as directed by Engineer and as per specification (R.A)	761.0	Sqm	233.31	177,548.91
53	Providing and casting in situ controlled cement concrete M-25 for R.C.C raft and cut-off walls including necessary vertical pin headers incl. formwork, vibrating, ramming and curing complete	55.7	Cum	4697.25	261,636.83
54	Rolling and watering of earthworks in layers with vibratory roller including filling in depressions which occur during the process as directed	468.0	Cum	22.95	10,740.60
55	Providing and casting in situ ordinary cement concrete M-15 mix and providing necessary pin headers including shuttering, scaffolding, laying, vibrating, curing and finishing complete without V-Groves. (A) Height from 0.0m to 5.0m	414.0	Cum	3921.64	1,623,558.96
56	Providing and fixing "W" type metal beam crash safety barrier comprising of single row 3 mm thick galvanized sheet to be fixed on ISMC 150 (150 mm x 75 mm x 5.4 mm) series channel vertical post to be spaced 2.0 mtr c/c to be kept 1.65 mtr height including necessary foundation, fitting with bolts, painting, radium indication patta on W beam and required all process as per specification and as per drawings	60.0	Rmt	3454.20	207,252.00
57	Supplying & laying of bi-axial extruded high modulus polypropylene geogrid conforming to MORTH specification for base/sub-base reinforcement having minimum tensile strength 30KN/m in the longitudinal and transverse direction, junction efficiency not less than 95% and with 38mm x 38mm mesh opening	223.5	Smt	253.51	56,659.49

It. No.	Item of Work	Quantities estimated out or less	Unit	Rate	Amount
				In Figure	
1	2	3	4	5	6
58	Road marking with hot applied thermoplastic paints (Yellow color no. 356 on C.C road & white colour on asphalt surfaces) with reflectorising glass beads on bitumin surface providing and laying a hot applied thermoplastic compound 2.5mm thick including reflectorising glass beads @250 gms per sqm area, thickness of 2.5mm is excluding of surface applied glass beads as per IRC: 35-2015. The finished surface to be level, uniform and free from streaks and holes. Zebra patta/bump patta lane/ center line / edge line / cut patta. The white color marking should provide luminance coefficient of cement road shall be min 130 mcd/m ² /lux and asphalt road shall be min 100 mcd/m ² /lux during the service life during the day time. The marking should meet the performance criteria for night time reflectivity, wet reflectivity and skid resistance as mentioned in the section-15 of IRC 35-2015. Warranty for the retro reflectively should be two years	38.0	Smt	367.72	13,973.36
59	Cat Eye/ road stud/ rpm : Supplying of molded twin shanks raised pavement markers made of polycarbonate and ABS moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 13656 kgs tested in accordance to ASTM D 4280 type H and complying to specifications of category A of MORTH circular no RW/NH/33023/10-97 Dt III Dt 11.06.1997. The height, width and length shall not exceed 20mm, 130mm and 130mm and with minimum reflective area of 13 sqcm on each side and the slope to the base shall be 35 +/- 5 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 +/- 2 mm and height not less than 30 +/- 2 mm) from the body is to be a minimum value 500 kgf. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturers recommendation and the color of the marker should be as per the IRC 35-2015 and as directed by Engineer in charge	38.0	Nos.	326.23	12,396.74

It. No.	Item of Work	Quantities estimated out or less	Unit	Rate	Amount
				In Figure	
1	2	3	4	5	6
60	Hazard marker sign:-Providing and fixing Work in Progress sign boards made out of 2mm aluminium sheet; size 90 x 30cms. rectangle as per the design of IRC-67-1977 pre treated with phospheting process & acid teching; coated with one coat of epoxyprimer and two coats of best qualityepoxy paint; reflectorised with retro reflective sheeting as per latest M.O.S.T. Specifications; 3.1m long stand postand frame fabricated from suitable sizeiron angle of 35 x 35 x 3mm & 50x50x5mm painted with best qualityepoxy coatings. The fixing at site shall be in 1:2:4 CC block of size 45 x45 x 60cms. for each leg. including excavation curing tec. complete under the supervision of engineer in charge.(A) Engineer Grade(VR)	12.0	Nos.	2423.74	29,084.88
61	Cautionary warning sign :-Providing and fixing Work in Progress sign boards made out of 2mm aluminium sheet; size 90 x 90 x 90 cms. equilateral triangle as per the design of IRC-67-1977 pre treated with phospheting process & acid teching; coated with one coat of epoxyprimer and two coats of best qualityepoxy paint; reflectorised with retro reflective sheeting as per latest M.O.S.T. Specifications; 3.1m long stand postand frame fabricated from suitable sizeiron angle of 35 x 35 x 3mm & 75x75x6mm painted with best qualityepoxy coatings. The fixing at site shall be in 1:2:4 CC block of size 45 x45 x 60cms. for each leg. including excavation curing tec. complete under the supervision of engineer in charge.(A) Engineer Grade(VR)	2.0	Nos.	3808.65	7,617.30
62	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth consolidating each deposited layer by ramming and watering	311.0	Cum	136.91	42,579.01
63	Dismantalling the existing structures including removing and stacking the dismetalled materials as and where directed Stone Masonary	113.0	Cum	409.22	46,241.86
64	Excavation for foundation up to 1.5m depth incl. Sorting out & Stacking of useful materials & disposing off the excavated stuff up to 50mt lead (C) Hard Murrum	200.0	Cum	432.61	86,522.00
65	Providing and laying in position FE 500/550D TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) Piers (B) Abutments © R.C.C Returns & walls/caps/copings	1.4	MT	73858.69	101,924.99
66	Providing and laying in position FE 500/550D TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) R.C.C kerb (B) R.C.C Footpath (C) R.C.C Approach Slab (D) Wearing Coat	0.7	MT	73243.02	52,734.97

It. No.	Item of Work	Quantities estimated out or less	Unit	Rate	Amount
				In Figure	
1	2	3	4	5	6
67	Providing and casting in situ ordinary cement concrete M-20 for various thickness wearing coat laid as directed including tamping, vibrating, finishing, curing and filling joints with bitumen complete	40.4	Cum	4338.66	175,281.86
68	Diversion: Providing temporary diversion suitable for traffic during the construction period of the C.D. structure work by levelling existing ground and constructing suitable compacted embankment, road surface with providing, laying & consolidation of 200 mm WBM in layers on carriage width with safety measures like sign board, guard stone & maintain for motorable road throughout construction period etc. and also dismantle diversion after completion of work etc. complete as per instruction of engineer in charge	190.0	Rmt	1847.29	350,985.10
69	Supplying and fixing reinforced concrete heavy duty non-pressure pipes with collars for culverts carrying heavy traffic as per IS 458-1991 specifications including setting the pipes in C.M. 1:2 watering and laying (to level or slopes) of class NP3 of following internal diameters.(v) 1200mm dia.	30.0	Rmt	5560.01	166,800.30
70	Taking credit for NP3 Pipes	90.0	Rmt	-1809.44	-162,849.53
71	Credit for existing material Metal beam crash barrier (70% of actual rate analysis)	50.0	Rmt	-1072.16	-53,607.82
72	Carting and taking Credit for reinforcement in solid slab (70kg/cmt) 70% of basic rate	3267.5	kg	-41.55	-135,764.87
73	Credit for Dismantled items	1.0		-7724.00	-7,724.00
74	Carting and taking Credit for Pipe 1200mm Dia	90.0	Rmt	-3001.75	-270,157.71
75	Deduction of 70% credit of useful dismantle material of diversion	1.0		-173922.35	-173,922.35
Amount in Word		Rupees Seven Crore thirty eight lakh nine thousand one hundred and ninety one and fourteen paise only			₹ 73,809,191.14

It. No.	Item of Work	Quantities estimated out or less	Unit	Rate	Amount												
				In Figure													
1	2	3	4	5	6												
<p>I/We am/are willing to carry out the work at _____ % above/below the (percentage should be written in figure and words only) Estimated rates as mentioned above, amount of my/our tender works out as under.</p> <table> <tr> <td>Estimated Amount</td><td>Amount</td></tr> <tr> <td>Put to Tender: RS.</td><td>Put to Tender: RS.</td></tr> <tr> <td>Deduct: % Below</td><td>Add: % Above</td></tr> <tr> <td>Net: RS.</td><td>Total: RS.</td></tr> <tr> <td>In Words RS.</td><td>In Words RS.</td></tr> <tr> <td colspan="2">(Please Strike out whichever is not applicable)</td></tr> </table>						Estimated Amount	Amount	Put to Tender: RS.	Put to Tender: RS.	Deduct: % Below	Add: % Above	Net: RS.	Total: RS.	In Words RS.	In Words RS.	(Please Strike out whichever is not applicable)	
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Net: RS.	Total: RS.																
In Words RS.	In Words RS.																
(Please Strike out whichever is not applicable)																	
<p>Note:</p> <ol style="list-style-type: none"> The Contractor shall exhibit a board with detailed specification and details of work as directed by the Engineer-In-Charge for which no extra payment shall be made. The labour cess will be deducted as per prevailing rules i.e. 1% of the work done. GST and Income tax TDS will be deducted at a source while making payments of bills. In all R.C.C. items in Rate Analysis Standard Cement Consumption has been taken as per Govt. G.R.: PRC-10/2017 Cement Consumption/16/C Date: 11/05/2017 as stated in S.O.R. therefore in R.C.C. items where there is a change as per actual mix design the cost of difference of cement consumption have been deducted from the rate of original item at the rate of input rate mentioned in all the tender. Credit amount of Rs. <u>8,04,026.25</u> shall be recovered from the running bill in which dismantle item will be recorded for payment. 																	
Signature of Contractor		 Deputy Executive Engineer (R & B) (P) Sub Division Morbi		 Executive Engineer (R & B) (P) Division Morbi													

CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN MORBI DISTRICT - PACKAGE -2

CEMENT CONSUMPTION STATEMENT

Sr. No.	Sl. No.	Description of Items	Qty.	Consumption rate in Kg	Unit	Total in Kg
		3	4	5	6	7
1	2	Providing and laying plain cement concrete in levelling course complete as per drawings and technical specifications as per sections 1500, 1700 and 2100 of MORTH. (M-15)	788.7	290.0	Cum	228722
2	4	Providing and laying plain cement concrete grade M-15 PCC Toe wall for toe protection i.e. to prevent the slope pitching from sliding down, with graded machine mixed stone aggregate from 6 mm to 40 mm including tamping, vibrating, leveling and curing complete with all formwork, dewatering wherever required including all materials, labours, plants, machineries & tools, all leads and lifts, etc. complete as per specification.	369.6	290.0	Cum	107183
3	6	Providing and casting in situ controlled cement concrete M-25 for R.C.C. box structure, as per drawings. Stem of Retaining wall etc. using 6 mm to 20 mm machine crushed well graded stone aggregate, sand of approved quality, OPC 53 grade cement with contractor's own concrete mix design etc. complete as per specification. The rate is inclusive of all materials, including necessary mixing in fully automatic batch mix plant, transport, curing, vibrating, placing in position, scaffolding, staging, normal shuttering, formworks, deshuttering carefully, making good the damages, fixing embedment, inserts, pockets, wherever necessary, with all lead and lift with contractor's labour, tools & plants, machineries, as required, with including cost of fair finish formwork.	3394.2	380.0	Cum	1289808
4	11	Providing and laying plain cement concrete grade M-20 curtain wall with minimum depth below floor level of 2m on upstream and 2.5m on downstream side as per clause 20.1.2.3 of IRC-SP-13:2004 and section 2507.1 of MORTH specification.	789.1	360.0	Cum	284092
5	15	Providing and casting in situ controlled cement concrete M-25 for Parapet Wall, as per drawings. Stem of Parapet wall etc. using 6 mm to 20 mm machine crushed well graded stone aggregate, sand of approved quality, OPC 53 grade cement with contractor's own concrete mix design etc. complete as per specification.	98.4	380.0	Cum	37383
6	16	Providing and casting in situ controlled cement concrete M-30 for average 75 mm thick wearing coat laid as directed including tamping, vibrating, finishing, curing and filling joints with bitumen complete	227.9	410.0	Cum	93453
7	24	Cement Concrete Pavement (Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, transported to site, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing)	384.0	400.0	Cum	153600
8	28	Providing and laying plain cement concrete grade M-20 PCC protection wall, with graded machine mixed stone aggregate from 6 mm to 40 mm including tamping, vibrating, leveling and curing complete with all formwork, dewatering wherever required including all materials, labours, plants, machineries & tools, all leads and lifts, etc. complete as per specification.	227.6	360.0	Cum	81918
9	31	Providing and laying plain cement concrete in levelling course complete as per drawings and technical specifications as per sections 1500, 1700 and 2100 of MORTH. (M-10)	58.0	220.0	Cum	12760
10	36	Providing parapet of ordinary cement concrete M-200 as per detailed drawings with necessary reinforcement including shuttering, laying vibrating and finishing to line and level complete (ii) Cast in situ.	31.7	360.0	Rmt	11415
11	40	Providing and casting in situ Controlled Cement Concrete M-25 for R.C.C solid slab including centering, scaffolding, curing and finishing complete	35.9	380.0	Cum	13642

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**Executive Engineer
R & B (P) Division
Morbi**

CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN MORBI DISTRICT - PACKAGE -2


REINFORCEMENT CONSUMPTION STATEMENT


Sr.No	It. No.	Description of Items	Qty.	Unit	Total
1	5	Providing and fixing in position (Thermo mechanically Treated bars) TMT Fe550D CRS conforming to IS 1786 reinforcing bars of various diameters for Box structure , retaining wall, etc. as per detailed designs and drawings and schedule including cutting, bending, hooking the bars, binding with 18 SWG GI wires with cost of all labour, materials, tools, plants, equipments, supporting as required with all lifts and leads etc. all complete as per specification and as directed by Engineer The rate includes for supply, loading, unloading, transporting to site, cutting, bending, lap length, hooking, placing, tying in position with contractor's own binding wire, welding, forming the cage and lowering it in position in pile bore etc. Welding and supporting in position to ensure lines and levels during concreting, maintaining proper cover/ spacing, all leads & lifts, etc. including contractor's own equipment, labour, supervisor, taxes, machineries, etc. complete as per drawings and specification.	309.55	MT	309.55
2	44	Providing and laying in position Fe 550/550 D CRS TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) Solid Slab / App slab / Wearing Coat	17.82	MT	17.82
3	65	Providing and laying in position FE 500/550D TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) Piers (B) Abutments @ R.C.C Returns & walls/caps/copings	1.38	MT	1.38
4	66	Providing and laying in position FE 500/550D TMT bar reinforcement including cutting, bending, hooking and tying complete as per detailed drawings for the following. (A) R.C.C kerb (B) R.C.C Footpath (C) R.C.C Approach Slab (D) Wearing Coat	0.72	MT	0.72
				Total	327.4 MT

CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN MORBI DISTRICT - PACKAGE -2

POL STATEMENT


Sr. No.	Description	Amount	
1	Amount put to tender	= ₹ 74,613,217	A
2	Cost of Cement ,Steel, Emulsion & Asphalt	= ₹ 32,743,668	B
	Cement	₹ 13,291,167	B1
	Steel	₹ 19,452,501	B2
	Asphalt (VG-30)	₹ -	B3
	Asphalt (VG-40)	₹ -	B4
3	Cost of DTP except Cement, Steel & Asphalt C = A - B	= ₹ 41,869,550	C
4	Cost of other Material	= ₹ 4,828,062	D
5	Cost of POL Fuel	= ₹ 2,215,410	E
6	Cost of Labour F = C - (D + E)	= ₹ 34,826,077	F



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CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN MORBI DISTRICT - PACKAGE -2

7	Percentage of Cement B1 / A x 100	$\frac{₹ 13,291,167.26}{₹ 74,613,217.41}$	x	100	=	17.81%
8	Percentage of Steel B2 / A x 100	$\frac{₹ 19,452,500.65}{₹ 74,613,217.41}$	x	100	=	26.07%
11	Percentage of Other Material D / A x 100	$\frac{₹ 4,828,061.91}{₹ 74,613,217.41}$	x	100	=	6.47%
12	Percentage of Labour F / A x 100 assume 40% of labour amt	$\frac{₹ 13,930,430.97}{₹ 74,613,217.41}$	x	100	=	18.67%
13	Percentage of POL fuel F / A x 100	$\frac{₹ 2,215,410.15}{₹ 74,613,217.41}$	x	100	=	2.97%
14	Percentage of plant and Machineries F / A x 100 assume 60% of labour amt	$\frac{₹ 20,895,646.46}{₹ 74,613,217.41}$	x	100	=	28.01%
Total						100%



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CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN MORBI DISTRICT - PACKAGE -2

COST OF BASIC MATERIALS

Sr. No.	Materials	Qty.	Unit	Rate	Per	Amount in Rs.
1	2	3	4	5	6	7
1	Cement	2539.4	M.T.	5234	M.T.	₹ 13,291,167.26
2	TMT/HYSD Bars	327.4	M.T.	59420	M.T.	₹ 19,452,500.65
					TOTAL	₹ 32,743,667.91



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CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN MORBI DISTRICT - PACKAGE -2

COST OF OTHER MATERIALS

Sr. No.	Materials	Qty.	Unit	Unit Rate	Amount in Rs.
1	2	3	4	5	6
1	Earth	9699.63	cum	40.00	₹ 387,985.38
2	Metal 40-63mm	347.66	cum	303.74	₹ 105,597.15
3	Sand	3479.30	cum	293.00	₹ 1,019,433.85
4	Kapachi	6616.47	cum	471.73	₹ 3,121,185.25
5	Metal 19-26.5 mm	324.66	cum	471.73	₹ 153,150.59
6	Grit	115.86	cum	351.37	₹ 40,709.69
7	Stone Dust	0.00	cum	160.85	₹ 0.00
					₹ 4,828,061.91


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CALCULATION OF MATERIALS

[illegible]

Item No.	Brief Description	Qty.	Unit	Metal 25-50mm Cum	Metal 40-63mm Cum	BT 75-26.5mm Cum	Eari Cum	Quarry Spall Cum	Sand Cum	Kapchi Cum	Gravel Cum	Hard Murrum Cum	Metal 26.5 to 4.75 mm Cum	Grit Cum	Stone Dust Cum	Bricks Cum
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
22	Construction of granular sub base with coarse graded material (Grade II) (Table- 400- 2) of 200 mm by providing coarse graded material Metal Crushed using size 53mm to 26.5 mm @ 27.5%, 26.5 mm to 9.5 mm @ 22.5%, 9.5mm to 4.75mm @12.50% and 4.75mm below @ 37.5% spreading in uniform layers with including and mixing the material obtained from cutting BT road by milling machine using motor grader on prepared surface mixing by mix in place method with rotavator at OMC and compacting with vibratory roller to achieve the desired density complete as per Clause 401.2 Table 400.3 grade-V	155.3	Cum										116.49	38.83		
23	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density-Grading 1, Using Screening Crushable type such as Moorum or Gravel.	281.5	Cum		256.1832									16.9		
24	Cement Concrete Pavement (Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, transported to site, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joints sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing)	384.0	Cum						175.3	350.6			33.8			
28	Providing and laying plain cement concrete grade M-20 PCC protection wall, with graded machine mixed stone aggregate from 6 mm to 40 mm including tamping, vibrating, leveling and curing complete with all formwork, dewatering wherever required including all materials, labours, plants, machineries & tools, all leads and lifts, etc. complete as per specification.	227.6	Cum						105.5	211.0						
31	Providing and laying plain cement concrete in levelling course complete as per drawings and technical specifications as per sections 1500, 1700 and 2100 of MORTH. (M-10)	58.0	Cum						28.1	53.3						
33	Granular sub base Grade 1 with black trap crushed stone well graded material (Table-400.1) by mix in place method construction of granular sub base by providing black trap crushed stone well graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC and compacting with vibratory roller to achieve the desired density complete. (As per technical specification clause-401) for Gr-1 Material	26.7	Cum										20.04	6.68		
34	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density-Grading 2, Using Screening Crushable type such as Moorum or Gravel.	100.5	Cum		91.8732								12.1	6.0		
36	Providing parapet of ordinary cement concrete M-200 as per detailed drawings with necessary reinforcement including, shuttering, laying vibrating and finishing to line and level complete.(iii) Cast in situ.	211.4	Rmt						98.0	196.0						

Item No.	Brief Description	Qty.	Unit	Metal 25-30mm Cum	Metal 40-63mm Cum	RT 75-25.5mm Cum	Ean. Cum	Quarry Spall Cum	Sand Cum	Rapchi Cum	Gravel Cnt	Hard Murrum Cum	Metal 25.5 to 4.75 mm Cum	Grit Cum	Stone Dust Cum	Bricks Cum
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Total				0	348	0	9700	0	3479	6616	0	0	325	116	0	0

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CONSTRUCTION OF CROSS DRAINAGE STRUCTURES ON VARIOUS ROADS IN MORBI DISTRICT - PACKAGE -2

POL COST CALCULATION

Consumption of diesel considered : 1 Liter / 4 KM
Cost of diesel considered : 91

Consumption of oil considered : 1 Liter / 150 KM
Cost of oil considered : 200

Item No	Material	Total Quantity	Unit	Qty. per trip	No of trips	Lead	Total Km	Consumption (Ltr)		Rate		Total cost
								Diesel	Oil	Diesel	Oil	
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Cement	2539.39	MT	20 MT	126.97	15	1905	476	13	₹ 43,328.34	₹ 2,539.39	₹ 45,867.73
2	Steel & HT	327.37	MT	20 MT	16.37	15	246	61	2	₹ 5,585.80	₹ 327.37	₹ 5,913.17
3	Bulk asphalt & Emulsion	0.00	MT	20 MT	0.00	25	0	0	0	₹ 0.00	₹ 0.00	₹ 0.00
4	Earth	15519.42	MT	8.5 MT	1825.81	10	18258	4565	122	₹ 415,372.59	₹ 24,344.18	₹ 439,716.77
5	Metal 40-63mm	556	MT	8.5 MT	65.44	25	1636	409	11	₹ 37,219.69	₹ 2,181.37	₹ 39,401.06
6	Sand	5566.87	MT	8.5 MT	654.93	25	16373	4093	109	₹ 372,489.38	₹ 21,830.88	₹ 394,320.26
7	Kapachi	10586.34	MT	8.5 MT	1245.45	25	31136	7784	208	₹ 708,351.01	₹ 41,515.08	₹ 749,866.09
8	Metal 19-26.5 mm	519.45	MT	8.5 MT	61.11	25	1528	382	10	₹ 34,757.43	₹ 2,037.07	₹ 36,794.49
9	Grit	185.38	MT	8.5 MT	21.81	25	545	136	4	₹ 12,403.82	₹ 726.96	₹ 13,130.79
10	Stone Dust	0.00	MT	8.5 MT	0.00	25	0	0	0	₹ 0.00	₹ 0.00	₹ 0.00
Unit Diesel Consumption per unit time												
11	Spreading (Non BT)	8269.81	cum	30 m³/hr	275.7 hrs	10	0.10	276	2757	28	₹ 250,850.93	₹ 5,513.21
12	Spreading (BT)	0.00	MT	400 MT/day	0.0 days	50	2.00	0	0.00	0.00	₹ 0.00	₹ 0.00
13	Rolling (Non BT)	8269.81	cum	10 m³/hr	827.0 hrs	3	0.05	827	2480.94	41.35	₹ 225,765.84	₹ 8,269.81
14	Rolling (BT)	0.00	MT	200 MT/day	0.0 days	100	3.00	0	0.00	0.00	₹ 0.00	₹ 0.00
Total :											₹ 2,215,410.15	

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