Tree Translocation Scheme (Tree Protection Plan)

Brief Summary of Project

Project Details: - Preparation of Detailed Project Report for Widening/upgradation of existing single/intermediate lane to 2-lanes with earthen shoulders/ paved shoulder of Baysi-Bahadurganj-Dighalbank section of SH 99 (Purnia section-0+000 to 32+035 Km) from Km 0/000 to Km 73/840 under Purnia and Kishanganj Districts in the State of Bihar.

Section- Purnia division (0+000 to 32+035) The project road of this section is a part of SH-99 starting from Panisadara to Bhusabari in Purnia District in the state of Bihar for Project overview.

S.No	Project Road	Length	Traverse District	Lat/Long(Starting)	Lat/Long(Ending)
1	Panisadara to Bhusabari	32.035 Km	Purnia	25°51' (N) ,87°44' (E)	26°26' (N), 87°51' (E)

The proposed project road in this section starts at village Panisadara and at design chainage 0+000 where it follows SH-99 and travels 32.035 Km and passes through villages of Purnia district directly or indirectly. The proposed road is passing through Baisi, Baisa and Amour tehsil in Purnia District.

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BYPASS/REALIGNMENT-

The approved alignment of Purnia section (0+000 to 32+035) is a part of Byasi-Bahadurganj-Dighalbank strengthening and widening project which is initiating near Panisadara and terminating near Bhusabari village in this stretch. As per the details from BSRDCL, this road has ROW of 24m at some stretch and 30 m in the rest. Overall, the alignment is already revised due to avoiding some productive agriculture land, so there is no need for realignment again.

TRAFFIC CHARACTERISTICS-

Traffic varies by the hour, by the day and by the month. Hence it is essential to provide a factor which provides relationship between Average Annual Daily Traffic and Average Daily Traffic of the month corresponding to the traffic survey.

As per the vide circular letter no. RW/NH-33044/37/2015/S&R (R) dated 26TH 2016 the MORT& H revised upgradation to 4-lane in plain terrain with Traffic as 10,000 PCU/day.

The Average Annual Daily Traffic (AADT) is 10266 in the year 2021 and the project PCU will be more. So, the project stretch qualifies for 4-lane.

DETAILS OF AFFECTED TREES:

The entire linear stretch of roadside plantation along highway is declared as protected forest. About nearly 3555 no. of trees have been affected within the PROW of the entire project section from Panisadara to Bhusabari (0+000 to 32+035). 2219 trees are proposed to be translocated and remaining 1336 trees need to be felled. **List of trees (2219) need to be translocated are also attached.**

1: Detail of Land identified for translocation of Trees

• **Name of District of Identified Land:**	Purnia
• **Location of Identified Land for Translocation of Trees:**	Rest land for Avenue plantation both the sides of Proposed ROW (toward 15/12m from existing centreline) of entire project section of Purnia district (0+000 to 32+035).
• **Name of the forest division:**	Purnia Forest Division
• **No. of Trees for Translocation:**	2219

Calculation of Identified Land

- Required area for 01 tree= 3mx3m= $9m^2$
- Therefore, required area for 2219 trees= 2219x9= 19971 m^2 (2 Hectare)
- Required length for translocation of trees with available width 3 m= 6.657 Km.

Design Chainage		Cross Section	Remark	Width(L/R) (m)	Length(m)	Width(L+R)(m)	Area sq.m)
0+000	0+230	TCS-5	Rigid Pavement	8.50	230	17	3910
13+450	13+775	TCS-4	Flexible Pavement	5.50	325	11	3575
13+775.	14+555	TCS-5	Rigid Pavement	5.50	780	11	8580
22+005	22+555	TCS-4	Flexible Pavement	5.50	550	11	6050
22+555	23+055	TCS-5	Rigid Pavement	5.50	500	11	5500
23+055	23+405	TCS-4	Flexible Pavement	5.50	350	11	3850
Total Area							31465

- Available length for Translocation of Trees= (31465/3= 10488.3 m) 10.48 Km
- No. of trees which can be accommodated= 3496

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Methodology for Trees Translocation

Translocation is the term used to describe the digging and replanting of trees from one location to a new location. Due to wide extent and morphology of tree root system, translocation of trees usually involves substantial removal of roots.

Design and Documentation

It is ensured that the requirements such as timing of root pruning, size of root ball, translocate and lifting requirement, monitoring and post translocation maintenance, etc. shall be properly planned.

Safety precautions- Tree Translocation, like other tree management works, would be conducted in a controlled and safe manner. Workers who shall involve in translocate trees will be given adequate instruction and supervision to ensure that the tasks are completed in a safe manner.

Translocation operations

Tools and equipment- All tools and equipment shall be appropriate to the operations and prepared in advance. Digging and root pruning tools shall be sharp and clean in order to cut without breaking, crushing or tearing roots. Mechanical digging and root pruning equipment shall be operated according to manufacturers' recommendations to minimize root damage.

Lifting cables, chains, straps and/or slings shall be inspected and used according to manufacturers' instructions and specifications.

Preparation of root ball- Root pruning is sometimes required before translocating a tree. Sufficient time shall be allowed between preparation and final lifting for development of new roots capable of sustaining and continuing the growth of the translocated tree.

The root system of a woodland or open-grown tree will normally be widespread. Lifting such trees without initial preparation of a root ball will result in much of root system being left in the soil. After translocation, the tree crown may then die back, or the tree may not be able to recover and will die eventually.

The root ball size would be of a diameter and depth to encompass enough of the root system as necessary for establishment. Normally the diameter of a root ball is larger than its depth which seldom exceeds1 meter.

Pre-lifting operations: - Tree lifting operations shall be carefully timed so as to enable direct delivery to the receptor site. No translocation operations would commence until either the receptor site or the holding nursery is fully prepared. Tree uplifted must be translocated and watered the same day. Watering before lifting is recommended.

Before uplifting, the outer edge of the previously dug trenches shall be loosened from the surrounding soil, and the root ball can be shaped with taper on the sides, slanting inward toward the base. The first cut around the perimeter of the root ball should be made with a sharp tool. Cuts should be clean to avoid tearing or breaking the roots. The shaping and final

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cuts should be clean to avoid tearing or breaking the roots. The shaping and final cuts should be done by hand.

Temporary support of trees before lifting- A tree after pruning shall not be having extensive root support during the interim of the translocate process. It may be vulnerable to inclement weather such as typhoon or heavy rainfall.

Removal of the root system may sometimes aggravate the natural form and balance of a tree is likely to be jeopardized, a temporary support, such as guying or simple prop is essential.

Lifting and handling of root-balled trees- The root ball would be properly wrapped before lifting. Lifting shall be done by direct lift, with padded protection for the tree, using a machine of appropriate capacity connected to the support around the root ball, not to any other part of the trees. Trees shall not be lifted by the trunk as this can cause serious trunk injury but by its root ball which shall be properly prepared and wrapped. Root balls that are not properly protected would easily collapse during transplanting due to its own weight.

Post-planting Care- In case of translocation of trees within the project site amidst the construction activities, they will be well protected with robust fencing.

All newly translocated trees shall receive proper maintenance care in order to facilitate recovery of tree from the translocation shock. It would be ensuring the tree shall be stable before its root system is fully recovered to gain support.

The stress of a tree shall be observed immediately after translocation or gradually after a period of time. Proper care after transplanting will help to assure survival and minimize stress and ensure a higher successful rate. Maintenance of translocate trees will be in continuation till one year.

Annexure: - 1. Summary of Trees which needs to be translocated

2. Undertaking to bear the amount of translocation and translocation shall be done by User Agency
3. Geo-referenced Map of identified Land to translocate the trees (2219 No.)

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Detailed Summary of Trees for Widenng and Strengthening of SH-99 from Km 0+000 to 32+035 (Purnia section)

From km 0+000 to km 32+035			
Affected Trees/Plants	Left Side	Right Side	Total Trees / Plants (Both side)
Purnia District	994	1225	2219

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Detailed Summary of Trees for widening and strengthening of SH-99 Km 0.00 to 32.035 (Purnia Section)

(A) Detailed summary of affected plants (Both side) for Translocation Section-Purnia (0+000 to 32+035)

Girth Size	Left	Right	Total (Both Side)	Remarks
0-30	202	196	398	Need to be Translocated
31-60	390	571	961	
61-90	402	458	860	
Total	**994**	**1225**	**2219**	

(B) Detailed summary of affected plants (Both side) for Felling Section-Purnia (0+000 to 32+035)

Girth Size	Left	Right	Total (Both Side)	Remarks
91-120	318	351	669	Need to be felled
121-150	154	171	325	
>150	165	177	342	
Total	**637**	**699**	**1336**	

Abstract

From Km 0+000 to 32+035

Affected Trees/Plants	Left Side	Right Side	Total Trees / Plants (Both side)
(A) Translocation Plants	994	1225	2219
(B) Felling Plan	637	699	1336
Total Trees	**1631**	**1924**	**3555**

Effected Tree Details for Translocation in Purnia Forest Division SH-99 (0+000 to 32+035)

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(District-Purnia) (Panisadara-Bhusabari Section)

From 0.00 Km to 32.035 Km

Scientific Name	Tree Type	Left	Right	Left	Right	Left	Right	Grand Total
		0-30		31-60		61-90		
Mangifera indica	Aam	26	68	65	25	12	26	222
Spondias pinnata	Aamda	0	0	0	0	0	1	1
Vachellia nilotica	Acacia	20	27	4	1	0	1	53
Cassia fistula	Amaltash	1	1	0	1	1	2	6
Psidium guajava	Amrood	0	1	0	0	0	0	1
Terminalia arjuna	Arjun	6	14	13	0	0	0	33
Saraca asoca	Ashok	3	8	3	4	0	3	21
Other	Bahoor	1	0	0	0	0	2	3
Melia azedarach	Bakain	8	39	40	5	0	0	92
Kigelia africana	Balamkhera	0	0	1	1	0	0	2
Prosopis juliflora	Ballori	5	6	13	2	0	0	26
Ficus benghalensis	Bargad	0	0	0	0	0	2	2
Aegle marmelos	Bel	2	4	5	1	3	2	17
Ziziphus mauritiana	Ber	13	27	15	8	1	0	64
Senna siamea	Chakundi	0	0	1	0	0	0	1
Alstonia scholaris	Chhatwan	0	2	2	3	2	0	9
Madhuca longifolia	Dahua	2	4	7	2	0	0	15
Eucalyptus globulus	Eucalyptus	22	47	15	7	10	26	127
Gmelina arborea	Pani Gamhar	90	212	185	201	121	111	920
Gambhari arborea	Phool Gamhar	0	1	0	0	0	0	1
Ficus racemosa	Gular	3	26	13	4	3	2	51
Delonix regia	Gulmohar	22	32	15	9	1	2	81
Pithecellobium dulce	Jalebi	7	18	4	12	2	4	47
Syzygium cumini	Jamun	3	1	3	0	0	2	9
Lagerstromia.speciosa	Jarhul	0	1	0	0	0	0	1
Crotalaria	Jhunjhuna	2	7	1	0	0	0	10
Putrajiva	Jiyal	0	0	1	0	0	0	1
Other	Jugni	0	3	2	0	0	0	5

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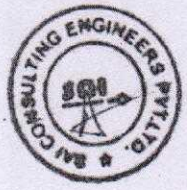
Bauhinia variegata	Kachnar	0	1	1	1	0	0	3
Neolamarckia cadamba	Kadam	20	72	184	235	71	20	602
Millettia pinnata	Karanj	22	42	12	0	0	1	77
Cassia occidentalis	Kasmar	23	90	53	10	0	0	176
Artocarpus heterophyllus Lam	Kathal	11	13	12	9	2	6	53
Cordia dichotoma	Lathora	0	0	0	1	0	0	1
Litchi chinensis	Lichi	5	6	0	0	0	0	11
Calotropis gigantea	Madar	0	9	3	5	0	1	18
Swietenia mahagoni	Mahogani	41	76	121	27	1	1	267
Azadirachta indica	Neem	6	17	10	8	1	4	46
Citrus limon	Nimbu	7	7	3	3	0	0	20
Ficus religiosa	Pipal	0	0	1	1	1	8	11
Hevea brasiliensis	Rubber	0	1	0	0	0	0	1
Tectona grandis	Sagwan	0	1	2	0	0	0	3
Annona reticulata	Sarifa	0	3	0	0	0	0	3
Betula alnoides	Saur	0	1	0	0	0	0	1
Bombax ceiba	Semal	3	12	11	20	34	74	154
Dalbergia sissoo	Shisham	3	4	4	14	18	20	63
Albizia lebbeck	Siris	14	13	31	47	38	19	162
Areca catechu	Supari	7	44	1	0	0	0	52
Borassus flabellifer	Tad	0	0	3	2	2	0	7
Tamarindus indica	Emli	0	0	0	0	1	2	3
	Total	**398**	**961**	**860**	**669**	**325**	**342**	**3555**



STRIP CHART / LINEAR PLAN FOR TRANSLOCATION OF TREES FROM KM 0/000 TO KM 32/000