



**GOVERNMENT OF ODISHA
DEPARTMENT OF WATER RESOURCES**

RENGALI IRRIGATION PROJECT

LEFT BANK CANAL

ANNUAL REPORT FOR THE YEAR 2015-16

OF LEFT CANAL DIVISION NO-II,

DUBURI



**EXECUTIVE ENGINEER
LEFT CANAL DIVISION NO.II
DUBURI**

PREFACE

The Principal Secretary to Govt., DoWR, Govt. of Odisha has issued instruction to submit an annual report on the activities of each Division under the Water Resources Deptt. This is a welcome step and is appreciated by all. A lot of hard work & dedication are involved in completing a work & step by step action of finishing a work need to be narrated & recorded for future reference.

The OECF Division No-IV, Badajhara was renamed as Left Canal Division No-II, Duburi & was shifted to Duburi on dt.1.02.2012 for playing a vital role in execution of canal system in phase-II of Rengali Irrigation Project. It was entrusted with four packages for construction of Left Bank Canal. These are

1. Construction of Left Bank Canal from RD 74.500 KM to RD 79.500 KM including all structures other than H.R. & C.R. under Package No - 30 of Rengali Irrigation Project.
2. Excavation of Left Bank Canal from R.D. 84.500 Km. to 89.500 Km. with 4 Nos. of V.R.B of Rengali Irrigation Project under Pkg. No.-32.
3. Construction of 4 Nos. of Cross Drainage Structures of L.B.C. from R.D. 84.500 Km. to 89.500 Km. of Pkg. No- 32 (A)
4. Construction of Additional VRB at R.D. 84.560 Km. & 89.230 Km. and CD at R.D. 85.055 Km. and 88.900 Km. of L.B.C. of RIP.

Out of the four packages, package No-32(A) namely “Construction of 4 Nos. of Cross Drainage Structures of L.B.C. from R.D. 84.500 Km. to 89.500 Km. of Pkg. No- 32(A)” was completed during 2014-15 & works for three packages are still continuing.

The report narrates salient features of different packages, programme for 2015-16 & achievement during 2015-16. Steps involved for ensuring quality assurance & inspection by higher authorities have also been mentioned for reference. The programme & achievement for 2015-16 have been shown in form of bar charts & photographs during various stages of execution have been attached for reference & record.

The guidance & advice of Er. Kabi Prasad Mishra, Superintending Engineer, Rengali Left Canal Circle No-I, Sukinda & valuable suggestions of Er.G.R Mohanty, PD-cum-CE & BM, BLB, Sukinda have helped a lot in bringing out this annual report to its present form.

Executive Engineer
Left Canal Division No-II
Duburi

Brief Introduction to Left Canal Division No-II, Duburi

The OECF Division No-IV, Badajhara was renamed as Left Canal Division No-II, Duburi on dt.1.02.2012 and was shifted to Duburi in Sukinda block, Jajpur district. The head quarter is just 2.00 Km away from Duburi chhak on Paradeep-Daitari express highway.

As the distribution system from RD 71.313 Km to 141.00 Km of Left Bank Canal (phase-II) is mainly situated in Jajpur district, the head quarter of the Division was fixed at Duburi. The Hon'ble Chief Minister, Odisha Sri Naveen Patnaik inaugurated its office building at Duburi on dt.5.01.2013.

The Division is headed by one Executive Engineer who is assisted by three Sub- Divisional Officers. The Sub-Divisions along with their headquarters are mentioned below.

Sl. No.	Sub-Division	Headquarter
1.	Left Canal Sub-Division No-I	Kuhika
2.	Left Canal Sub-Division No-II	Duburi
3.	Left Canal Sub-Division No-III	Duburi

Each Sub-Divisional Officer is assisted by two Assistant Engineers & two Junior Engineers.

Er. Prabodha Kumar Rout is presently working as Executive Engineer of this Division. Er.Deepak Ranjan Behera is working as Deputy Executive Engineer is in-charge of Sub-Division No-I. Er. Kshirod Kumar Tripathy, Assistant Executive Engineer, is in-charge of Sub-Division no-II & Er. Raghunath Swain is in-charge of Sub-Division No-III. Er. Ramaray Jarika, Assistant Engineer is working as estimator in the Division.

EXECUTION OF WORKS AND QUALITY ASSURANCE

1. Execution & daily supervision by field staffs:-

The works are supervised regularly on daily basis by the Junior Engineers & Assistant Engineers in-charge of the work. The Sub-Divisional Officers are responsible to execute the work as per the approved design (prepared and provided by competent authority) and specification which are specified in the agreement. Before starting the execution, the materials are tested for ascertaining their quality as per Indian Standard Code. Prior to concreting, required design mixes are prepared in the laboratory to get the ratio of the ingredients including water so that the same is strictly followed in concrete works. The sample of earth was taken from borrow area & is tested to know its suitability for use in canal embankments. The alignment of canal is given with precision and dug belling is done for excavation of canal. The sub-divisional officers check the levels at the field to ascertain accuracy of measurement. The Executive Engineer also inspects the site for checking & providing necessary technical guidance regularly so that a quality work is obtained.

A. Package No-30:- Construction of Left Bank Canal from RD 74.50 Km to 79.500 Km including all structures other than HR & CR under Package No-30 of RIP.

The estimate envisages the following components for execution. These are

- 1) Excavation of canal from RD 74.500 Km to 79.500 Km of Left Bank Canal.
- 2) Construction of cross drainage work at RD. 75.137 KM, at RD. 77.015 Km, at RD 77.460 KM, CD at RD 78.840 Km & CD at RD 79.330 Km.
- 3) Three Nos. of VRBs have been constructed at RD 74.811 Km at RD 75.252 Km & at RD 78.00 Km.

1. Earth work:

The initial levels of the work has been recorded before execution of earthwork. The strata has been observed from the bore hole data along the alignment of the canal. According to the bore hole data the rate of excavated earth has been arrived at. The earth from borrow area was sent for testing to ascertain its suitability & to know the value of maximum dry density of the borrowed earth. Objectionable materials that are unsuitable & interfere with proper bonding of embankment are removed. The earth is laid in a layer of 22.50 cm thick & clods are

broken to 5 cm to 7 cm. Each layer of fill is compacted in a systematic, orderly & continuous manner to ensure specific coverings by the compactor. In-situ-density tests are conducted with required frequency compared with standard proctor density obtained from laboratory. Compaction of earth fill will found OK if in-situ-density obtained is more than 98% of the density obtained earlier otherwise further rolling is done.

2. Cross Drainage Work:

Since the canal passes on a contour it has to cross many streams on its way. The cross drainage works have been designed & approved by the competent authority. The CD works are executed as per drawing & design. The CDs are generally barrels made up of RCC M25 concrete mix. The concrete is obtained by mixing various ingredients such as cement, sand & hard granite chips according to their mix proportion obtained from laboratory. Sieve analysis are conducted to get the required grade of materials. The fineness modulus for sand should be between 2.2 to 3.2. The silt content should not be more than 5%. The coarse aggregates should be well graded. The ratio of mixing of available coarse aggregates are to be ascertained for a particular quantity of materials transported from a particular quarry. The cement used are fresh & conform to specified manufactures as per the agreement. The steel used are HYSD bars from prime manufactures of steel in the country namely SAIL, TATA TISCON & RINL, Visakhapatnam. Slump tests are frequently to have a control over workability of concrete. Samples of cubes are casted & cured at site & is sent laboratory for getting the compressive strength of concrete which should be more than the required the compressive strength.

3. Bridges:

The bridges are essential for public transport system though these are obstacles in canal water flow. However bridges are to be constructed keeping in view the overall communication network of the area. Bridges are made as far as practicable at right angles to the axis of the channel.

There are three bridges constructed in this package. Out of these, one bridge at RD 78.000Km was constructed with a skew angle of 25 degree as the road axis is making an angle to the centre line of the canal. The bridge has been designed and approved by competent authority before it was executed.

4. Rough Stone Dry Packing :

In some reaches there is earth filling of considerable height which has to be protected by providing rough stone dry packing with hard granite stone boulders of 30cm thick. The quality, gradation and size of stone boulders are checked before it is used in the work. The stone boulders should be placed carefully such that minimum spalls are used to fill the interstices.

5. Turfing :

Turfing has been provided on embankment slopes in order to stabilize the slopes to prevent the soil erosion and weathering by the establishment of grass or other herbage. Due to less rainfall last year turfing has been done for a limited area of embankment slope. Balance area are to be turfed during this year.

B. Package No-32:- Excavation of Left Bank Canal from RD 84.500 Km to 89.500 Km with 4 Nos. of VRB of RIP.

The work envisages following components for execution. These are

- 1) Excavation of canal from RD 84.500 Km to 89.500 Km of LBC.
- 2) Construction of VRB at RD 86.920 Km, RD 87.213 Km, RD 87.910 Km & RD 88.227 Km.

1. Earthwork:

The canal excavation has been completed for the entire length of 5.00 Km except 225 mtr.(from RD 86.870 Km to 86.975 Km and 88.100 Km to 88.220 Km). In this location there is encroachment of canal land by villagers of Pimpudia, Arjunjhar, Nuadihi & Ambapal. The loss & damages to their property has been assessed by Tahasildar, Sukinda & proposal for compensation is pending at Govt. Level for approval. The earthwork includes cutting & filling where required. The inside slope of canal has been kept on 1.5 :1. The excavation has been done upto bed level. The initial level has been taken & payment has been made as per execution in the field. In the filling section, the earth has been laid in layers not exceeding 0.225 mtr thick. The clods are broken to maximum 5 cm to 7 cm size and compaction under OMC condition done with smooth vibro roller after adding required quantity of water.

Compaction tests have been conducted at each layer to check the percentage of compaction. The extra earth at the edges have been cut to get a finished section.

2. Construction of Bridges:

There was provision of constructing bridges at RD 86.920 Km, 87.213 Km, 87.910 Km & 88.227 Km. The bridges have been constructed as per approved design & drawing except the bridge at RD 86.920 Km. This has not started due to encroachment of canal land by the local people. The proposal for compensation to the encroachers are pending at Govt. level for which construction of bridge was delayed.

3. Toe wall:

Toe walls on country side has been kept to safe guard against seepage & slipping of earth. Toe wall have been constructed with CC M15 & RCC M20 at the toe of the outer slope of filling section where depth of filling is more than 2.00 mtr height. As the water table in the area is at higher level toe walls have been provided at selected locations.

4. Turfing:

Last year due to irregular rain fall turfing work could not be done at many location. The same would be done again this year.

C. ADDITIONAL PACKAGE:- Construction of Additional VRB at RD 84.560Km & 89.230Km and CD at RD 85.055Km & 88.900Km of LBC-II of RIP.

The estimate envisages for construction of following components.

- i) Construction of VRB at RD 84.560Km & 89.230Km of LBC.
- ii) Construction of CD at RD 85.055Km & 88.900Km of LBC.

1. Construction of Bridges:

As per demand of the local people to improve their communication network, 2 nos. of bridges are to be constructed across the Left Bank Canal at RD 84.560Km & 89.230Km. The drawing & design of the bridges have been approved before

execution of the works. The abutment & piers of the bridges at RD 84.560Km & 89.230Km have been constructed till date. The work is under progress.

2. Cross Drainage Works:

As the Left Bank Canal runs on a contour, there are many drains crossing the canals at different locations. Keeping in view safe discharge of drain water, two more Cross Drainage Works are constructed in this package. The Cross Drainage Work at RD 88.900Km is under progress.

3. Quality Assurance:-

For achieving a good quality work there is need of taking various quality control measures during execution. Quality control during the construction aims at ensuring the design as envisaged in plans and specifications is fulfilled at site.

The quality of materials are inspected as once these are transported from approved quarry by the field engineers. The Executive Engineer, Quality Control & Research Division, Sukinda is the Chief Research Officer who has the overall responsibility of checking and monitoring quality of works. Er. S.K. Mandal is the Executive Engineer, Quality Control & Research Division at present. He is assisted by Assistant Research Officers & other technical staffs for conducting field tests as well as sending materials to laboratory for testing. The field staff of quality control division & engineers in charge of this division carry out following field tests as per frequency required.

- i. Compaction tests of earthwork.
- ii. Sieve analysis of coarse aggregates & fine aggregates.
- iii. Silt content testing of fine aggregates.
- iv. Cube casting for compressive strength of concrete.
- v. Slump tests of concrete for ensuring proper workability of concrete.

The O.K.Cards are issued by the Executive Engineer, Quality Control & Research Division, Sukinda for the work. The O.K.Card is duly maintained & okayed by quality control staff before commencement of the work regularly. One copy of the O.K.card is submitted to the Executive Engineer, Quality Control & Research Division for his perusal & after a booklet containing the O.K cards are completed, it is sent back to the Executive Engineer Quality Control & Research Division for record.

4. Inspection by State Quality Monitors:

As per decision at higher level experienced and qualified retired engineers have been empanelled by Chief Engineer, Quality Control & Research, Bhubaneswar as SQMs for quality auditing of the works executed. As part of the programme, Er.S.N Ghosal, retired Chief Engineer, inspected the works from dt. 6.11.15 to dt.7.11.2015. His remarks on the overall quality of works was satisfactory.

5. Inspection of Higher Authorities:

Er. G.R. Mohanty, Project Director-cum-Chief Engineer & Basin Manager, Brahmani Left Basin, Sukinda & Er. K.P. Mishra, Superintending Engineer, Rengali Left Canal Circle No-I, Sukinda inspect the site regularly & provide technical guidance for making a better quality work. The work was also inspected by Er. Janaki Ballav Mohapatra, Engineer-In-Chief, Water Resources, Odisha on dt.09.03.2016. During his visit he shared his valuable experience on monitoring various projects & how to expedite the work in spite of various obstacles coming on the way.

Er.N.N.Nayak, Director, Research & Quality Control also inspected the work site on dt.10.03.2016. His remarks on the quality of works was satisfactory.

WORKS UNDER JICA ASSISTANCE

The Rengali Irrigation Sub project LBC-II, Phase-II (RD71.313Km to 141.000Km) is planned to provide irrigation facilities to an area of 72967Ha.(66,555 Ha flow & 6412Ha.lift irrigation). The state Govt. has received an ODA loan from JICA to finance the part of the Rengali Irrigation Sub project LBC-II, Phase-II. The following works have been entrusted to this division.

- 1) Package No-A-III :- Construction of Distribution system along Main Canal (RD 71.313Km to 100.490Km) excluding Bhuban Branch Canal & System and Sukinda Branch Canal &System.
- 2) Package No-E :- Construction of Main Canal (RD 107.500Km to 123.500Km) with structures (H.R, & C.R etc.).
- 3) Package No-C-IV:- Construction of Sukinda Branch Canal with Distribution system from RD 22.00Km to 29.00Km.

Package No-A-III :-

The work comprises of Distribution System along Main Canal from RD 71.313 km to 100.490 km excluding Bhuban Branch Canal & System and Sukinda Branch Canal & system. The Total Ayacut of these Canals is 5683.30 ha. The work consists of 11 nos of minor & Sub-minor canals offtaking from Left Bank Canal directly along with construction of 3 nos of Distributaries with their systems. As per JICA guide lines 80% of land is to be acquired before going for the tender. For this package-A(III), private land of 343.11Ac. is to be acquired from 33nos villages. Though land acquisition is going on, it is very slow.

The Principal Secretary to Govt. DOWR Odisha, Bhubaneswar during his visit to Sukinda on dated 11.02.2016, reviewed the progress of activities of land acquisition and tendering process of various packages under JICA. After review the package A-III, he suggested to take up steps for direct purchase of land in the canal where the land requirement is less than 10Ha. in a village and the same are at 11(1) stage of new act. He instructed to split up the Package No-A(III) into two sub packages namely A-III(A) & A-III(B).

The estimated cost of the Packages are as follows :-

1) Construction of Distribution system along Main Canal (RD 71.313Km to 100.490Km) excluding Bhuban Branch Canal & System, Sukinda Branch Canal & System, Kunida Distributary & its system, Damodarpur Distributary & its system, Kuhika Distributary & its system and Kamaladeipur Minor with its system under Package No. A-III(A). **– Rs. 16.572 Crores**

2) Construction of Kunida Distributary & system, Kuhika Distributary & system, Damodarpur Distributary & system along with Kamaladeipur Minor with its sub minor from RD.71.313Km to 100.490Km of LBC under Package No. A-III(B). **– Rs. 47.264 Crores**

DIRECT PURCHASE OF LAND

As per the instruction of Principal Secretary, DOWR, Govt. of Odisha, steps have been taken to directly purchase the land in a village where land acquisition requirement is less than 10 Hact. Records have been collected from Zone office, Sukinda & village wise list of farmers and area to be acquired are verified by the field Engineers & one retired Amin engaged for land acquisition purpose. Once village wise actual area to be acquired is found out, a requisition would be sent to Collector & District Magistrate of the District for his permission for starting the process of direct purchase of land acquisition.

PHOTOGRAPHS OF WORK SITE