



ABSTRACT

Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) - Announcement made by Hon'ble Minister (Municipal Administration and Rural Development, Implementation of Special Programme) – Construction of 20,000 Check Dams at a total cost of Rs.250.36 Crore under MGNREGS for the year 2017-18 – Permission accorded - Guidelines approved - Orders issued.

RURAL DEVELOPMENT AND PANCHAYAT RAJ (CGS.1) DEPARTMENT

G.O.(Ms).No.6

Dated: 05.01.2018

Read:

1. Announcement made by Hon'ble Minister (Municipal Administration and Rural Development, Implementation of Special Programme) on the Floor of the Legislative Assembly on 21.6.2017.
2. From the Director of Rural Development and Panchayat Raj Letter Roc.No.19625/2017/ MGNREGS-I-1, Dated 29.03.2017 and 31.07.2017.

ORDER:

The Hon'ble Minister for Municipal Administration and Rural Development, implementation of Special programme has made the following announcement in the floor of the Assembly on 21.6.2017 :-

மாண்புமிகு இதயதெய்வம் புரட்சித் தலைவி அம்மா அவர்களின் ஆசியுடன், மாண்புமிகு முதலமைச்சர் அவர்களின் ஆணைப்படி, கிராமப்புறங்களில் தண்ணீரை சேமித்து பாசனத்திற்கு பயன்படுத்திடவும், நிலத்தடி நீர் மட்டத்தினை உயர்த்திடவும், தமிழ்நாட்டின் ஊரகப் பகுதிகளிலுள்ள வாய்க்கால், ஓடைகள் மற்றும் கால்வாய்களின் குறுக்கே, வரும் 4 ஆண்டுகளில் 2 இலட்சம் தடுப்பணைகள் கட்டப்படும்.

நடப்பாண்டில், 20,000 தடுப்பணைகள், 40 ஆயிரம் ரூபாய் முதல் 3 இலட்சத்து 50 ஆயிரம் ரூபாய் வரை செலவில், மொத்தம் 250 கோடி ரூபாய் மதிப்பீட்டில் கட்டப்படும்.

2. In the letter 2nd read above, the Director of Rural Development and Panchayat Raj has stated that during the Empowered Committee Meeting on Labour Budget 2017-18, it has been instructed to take up new work on 2000 Check Dams under MGNREGS. It has therefore been proposed to construct Check Dams across gullies / channels from upstream to downstream to impede the flow of surface water in the stream / channel and water is retained for a longer duration in the previous soil or rock surface.

3. The Director of Rural Development and Panchayat Raj has also stated that the technical details for the construction of Cement Concrete check dams (2000), Boulder check dams (9300) and Gabion check dams (8700) are prepared based on the guidelines issued in SAMARTHYA Technical Training Manual and the book on permissible works under MGNREGS. The Director of Rural Development and

Panchayat Raj has worked out the funding pattern for construction of 20,000 check dams (2000 Cement concrete Check dams, 9300 Boulders Check dams, 8700 Gabion Check dams) for the year 2017-18 under MGNREGS as follows:

(Rupees in lakhs)

Description	Material Component (85.49%)			Labour Component (14.51%) (Central Share-100%)	Grand Total
	Central Share-75%	State Share-25%	Total		
Construction of 2000 Cement concrete Check dams	4453.23	1484.41	5937.64	1062.36	7000.00
Construction of 9300 Boulders Check dams	4435.124	1478.374	5913.498	1247.502	7161.00
Construction of 8700 Gabion Check dams	7163.210	2387.737	9550.947	1324.053	10875.00
Total	16051.564	5350.521	21402.085	3633.915	25036.00

4. The Director of Rural Development and Panchayat Raj has therefore requested permission for the construction of 20,000 Check Dams consisting of 2000 Cement Concrete Check Dams, 9300 Boulder Check Dams and 8700 Gabion Check Dams at a total cost of Rs.250.36 Crore under MGNREGS for the year 2017-18 and approve the guidelines therefor.

5. The Government, after careful examination of the proposal of the Director of Rural Development and Panchayat Raj, hereby accord permission for the Construction of 20,000 Check Dams consisting of 2000 Cement Concrete Check Dams, 9300 Boulder Check Dams and 8700 Gabion Check Dams at a total cost of Rs.250.36 Crore (Rupees Two Hundred and Fifty Crore and Thirty Six Lakh only) under Mahatma Gandhi National Rural Employment Guarantee Scheme for the year 2017-18 and approve the guidelines annexed to this order, subject to the condition that as the estimates are based on type design and the actual execution in site are bound to vary,

- a) the design and measurements need to be adopted keeping economy in mind.
- b) the savings need to be accounted for as per the standard procedure and
- c) proper GIS tagging is to be carried out.

6. This order is issued with the concurrence of Finance Department vide its U.O.No.56029/RD/2017, dated 27.11.2017.

(BY ORDER OF THE GOVERNOR)

**HANS RAJ VERMA
ADDITIONAL CHIEF SECRETARY TO
GOVERNMENT**

To
The Director of Rural Development and Panchayat Raj,
Chennai – 15.

All District Collectors (Except Chennai)

(Thro' the Director of Rural Development and Panchayat Raj,
Chennai – 15)

All Project Directors, District Rural Development Agencies

(Thro' the Director of Rural Development and Panchayat Raj,
Chennai – 15)

The Accountant General, Chennai – 18.

Copy to:

The Pay and Accounts Office (South), Chennai – 35.

The Finance (RD) Department, Chennai – 9

Chief Minister's Office, Secretariat, Chennai-9.

The Senior Personal Assistant to Hon'ble Minister (Municipal Administration,
Rural Development and Implementation of Special Programme), Chennai-9.

The Principal Private Secretary to Additional Chief Secretary to
Government, Rural Development and Panchayat Raj Department, Chennai – 9.

The Rural Development and Panchayat Raj (OP.2) Department,
Chennai – 9

The National Informatics Centre, Chennai – 9.

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//FORWARDED BY ORDER//

W. C.
SECTION OFFICER

6/10/79
5/1/18

ANNEXURE**GUIDELINES FOR THE EXECUTION OF CHECK DAM**

**(G.O.(MS).No.6, RURAL DEVELOPMENT AND PANCHAYAT RAJ (CGS-1)
DEPARTMENT, DATED : 05.01.2018)**

Introduction

A check dam is a structure constructed across a stream, channel or waterway to store the water there by reducing the flow velocity of water and also prevent soil erosion. The construction of check dam is an old method of storage of running water in a particular place. Three types of Check Dam namely Cement Concrete Check Dam, Boulder Check Dam and Gabion Check Dam are adopted in this proposal.

Importance of the construction of check Dam

A check dam is a barrier placed in the flow path of a passing waterway such as a channel, stream etc., which helps to collect water in that particular place. This storage of water increases infiltration of surface water through rainfall to groundwater and also reduce the effect of erosion while trapping transported sediments and preventing downstream transport.

Our state depends largely upon monsoon for its Water Resources. The normal annual rainfall of the state is about 945 mm of which 48% is through the North East monsoon and 32% through the South West monsoon. Since the state is entirely dependent on rains for storage and recharging of its water resources, monsoon failures during last year had led to water scarcity and severe drought.

Also, the seasonal availability of the rainfall in the state shows a geographical variation. Moreover heavy rainfall in short spells during monsoons makes the problem more serious to our rain fed agriculture resulting in removal of fertile surface soil, thereby leading to low water holding capacity and depleted fertility status of the lands which in turn would result in poor crop production. Taking into account of the importance of rainwater conservation and ground water recharge, it is the right time to look upon means to utilize a part of the surplus surface runoff flowing down to the sea through construction of Check Dams.

Objective:

Check dams are constructed across gullies/channels from upstream to downstream, streams for impeding the flow of surface water in the stream / channel and water is

retained for a longer duration in the pervious soil. The broad objectives of Check Dams are,

- Ground water recharge.
- It controls the water velocity and reduces soil erosion.
- The stored water improves soil moisture of the adjoining area and improve land fertility allows percolation to recharge the aquifers.
- Other uses by villagers like bathing, washing, fishing, recreation and also useful for livestock depending on location and potentiality.
- To provide drinking water facilities in the villages along both the sides of the river after monsoon period.
- Check dams provide relatively good removal of coarse and medium size sediment from runoff.

Types of Check Dams taken in MGNREGS:

The following three types of check dam are proposed to construct under MGNREGS 2017-18, based on the technical standards indicated in the SAMARTHYA Technical Training Manual issued by Ministry of Rural Development, Government of India.

- Boulder check dam – in hilly/Slope areas
- Gabion structure – used on steeper slopes
- Concrete check dam –in plain areas

Boulder Check Dam

Boulder check dams are used to reduce the flow velocities so as to bring the runoff velocities within permissible limits and to reduce the soil erosion. Boulder check dam is also used as recharge structure. Series of check dams can be used to transform the longitudinal gradient from a steep slope to a succession of flat steps with low drops. These check dams help in storing water and silt on their upstream.

Selection Criteria:

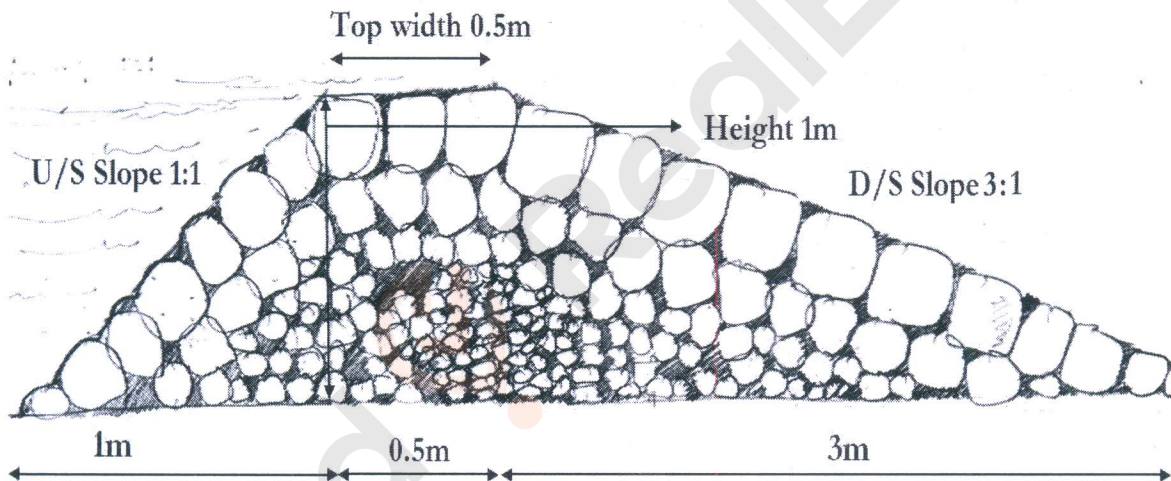
The following criteria shall be followed in the selection and construction of the boulder check dam during the year 2017-18:

- It shall be provided for minimum catchment area of even less than 5 hectare
- The height of the check dam in the middle of the stream should be 1m above ground level.

- It shall be provided where the bed slope is below 1 in 5.

Construction of a boulder check dam

The construction of a boulder check dam is done by placing bigger boulders outside over the smaller boulders as shown in the fig. The outermost edge of the downstream side must be dug up to a depth of 0.25m and the largest boulders available must be placed at the lower most edge of the check dam on the downstream and anchored to the ground. On the outside, the biggest boulders are placed on the downstream side. Since the boulder check dam is composed of highly porous material it is not expected to hold water for a long period. However it is well suited in the porous soil, since recharge of ground water is high in porous soil.



The following points to be considered while constructing boulder check dam:

- The top of the check dam should be lowest in the middle of the stream and highest at either embankment.
- Upstream slope of the check dam should be 1:1 while the downstream slope can vary from 2:1 to 4:1.
- The bed of the stream at the base of the check dam should be cleared of mud/sand up to 0.25m depth.
- Larger boulders should be placed on the outer portion of the check dam. Smaller stones can be used to fill up the interiors of the check dam.
- The use of angular boulders should be preferred, since the use of angular stones gives greater stability to the check dam than the use of rounded boulders.
- No boulder check dam should be constructed where the bed slope is above 1 in 5.

- Do not use boulders of diameter less than 0.15 m at any point which comes into contact with flowing water.
- Shale, limestone, mudstone or any loosely cemented rock must not be used, because they disintegrate when the water flows over it.
- The maximum height for loose boulder check dam is 1m.
- The top width of the boulder check dam is usually 0.5m
- The upstream slope of the boulder check dam should be fixed at 1:1
- The downstream slope of the boulder check dam is 3:1 (can also vary from 2:1 to 4:1 depending on the volume and velocity of runoff).

Gabion Structure

Gabion structures are of small stone and wire dams constructed across the supply/irrigation channel with a catchment area of 50-500 ha. They are also constructed to reinforce highly erodable stream embankments.

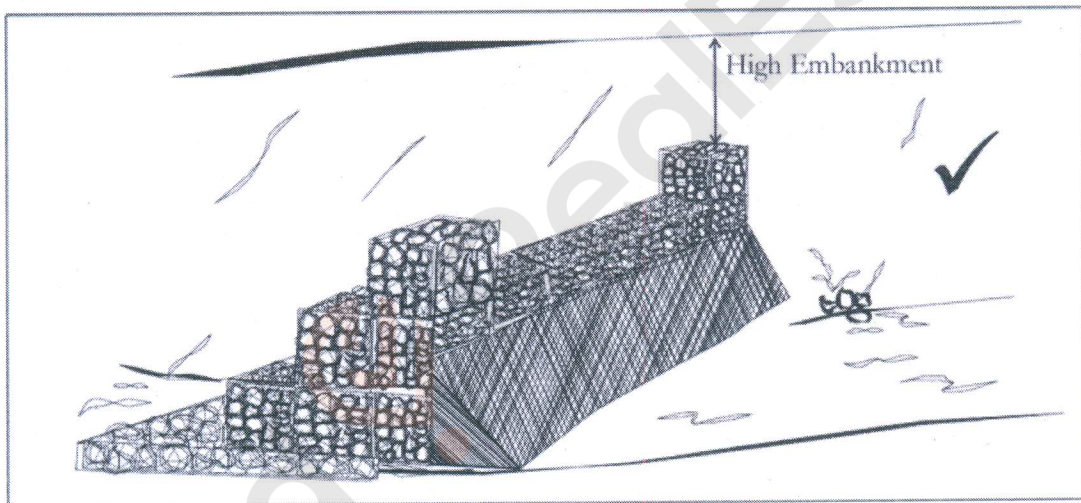
The main aim of constructing gabion structures is to reduce the velocity of water flowing through the supply/ irrigation Channel. By reducing the velocity of runoff, gabion structures help in

- a) Reduction in soil erosion;
- b) Trapping silt, which reduces the rate of siltation in water harvesting structures in the lower reaches of the watershed.
- c) Increasing recharge of groundwater.
- d) Increasing the duration of flow in the drainage line. Therefore, the capacity of the water harvesting structures created downstream on the drainage line is utilized more effectively and fully as they get many more refills.
- e) The biomass and debris flowing with the runoff water of first rain of rainy season is arrested in the wire mesh and check the water passing through the stones by the provision of wire mesh, resulting in the storage of water in the upstream side of the gabion.

Selection Criteria:

- The minimum independent catchment area for a gabion structure is 5 ha.
- The embankment should be stable and free from erodible material, otherwise the construction cost will increase.

- For maximizing storage in the structure, the bed slope of the upstream portion should be low. The flatter the upstream slope, the more will be the storage.
- The bed of the upstream of the structure should be of permeable soil, so that there will be a groundwater recharge as well as a temporary storage.
- The height of side embankments from the bed of the stream must be at least equal to the sum of the depth of peak flow in the stream and the designed height of the structure. (For example, if the height of the embankments is 6m and the depth of peak flow is 4 meters, then the height of the gabion must not exceed 2 meters. Otherwise water will jump over the sides. Hence, observation of the peak flows is imperative before a gabion structure is planned).



Construction of a Gabion Structure:

- First of all boulders must be collected on the location site. For the Headwall, a 1m wide and 0.6m deep trench should be dug across the stream bed from embankment to embankment. Foundation of similar depth should also be dug for the area demarcated for the apron and the sidewalls. For the headwall extension the embankments are cut to the appropriate depth.
- Before the foundation trench is filled, lengths of wire mesh are placed vertically at three places:
 - The upstream edge of the foundation;
 - Where the headwall ends and the apron begins; and
 - Against the downstream edge of the apron.
- At all three places the wire mesh runs along the entire length of the structure. Everywhere, 0.15m of the wire mesh is folded along the bed of the trench so that the mesh can be embedded under the boulders. After that the trench is filled with

boulders up to ground level. Then, the wire mesh is laid over the entire surface and tied to the mesh which has been embedded under the boulders. The headwall as well as the sidewalls should be constructed as boxes of 1 to 2m length and 1m height.

- d) First the four vertical faces of these boxes are erected with wire mesh which is tied to the wire mesh in the section below as well as the section alongside. Then the boxes are filled with boulders and covered at the top with wire mesh. This wire mesh is tied to each of the vertical faces on all four sides. Such boxes are filled up in succession till the structure is complete.
- e) To increase impermeability of the structure, a reverse filter should be constructed on its upstream face. This device is made by placing layers of small boulders, gravel, sand and mud against the structure.

However, the order of placement of these materials is exactly the opposite of the arrangement in a normal filter. The boulders are placed closest to the structure, with gravel, sand and mud being placed successively away from it. The reason for the reverse order is that we want the finest material to come into contact with water first. Following the normal filter scheme would have allowed water to pass unchecked through the boulders and coarser material on the outer surface. Even the used cement or fertilizer bags filled with fine sand may be placed against the structure in several layers so that the silt is trapped from entering the gabion structure.

The following points to be considered while constructing gabion structure:

- Do not build a gabion structure where the embankment is highly erodable or is of insufficient height.
- Do not build a gabion structure at a point on the stream, below which the stream drops sharply.
- Locate the gabion structure where the channel width is relatively low.
- Locate the structure where the bed-slope of the channel in upstream of the structure is low.
- Care must be taken that the boulders are placed compactly against each other so that they do not slide or move under the impact of water.
- Smaller boulders must be placed in the interior part of these boxes while the larger ones must be placed on the outside.
- Even the smallest boulder should be bigger than the gap in the wire mesh.
- The wire mesh must be stretched rigid so that there is no bulging or sagging.

- The wire used for tying the wire mesh sections must be of the same strength as the wire used in the wire mesh. It could either be of the same gauge or of a thinner gauge plied and twisted together.
- For height above 2m, the Headwall must be made as a series of steps sloping on the downstream side to impart stability to the structure.

Cement Concrete Check Dams

Cement Concrete check dams are highly effective practice to reduce flow velocities in channels and waterways in plain areas. Moreover, the dams themselves are simple to construct and do not rely on advanced technologies, thereby they can be applied in more rural and less advanced communities. They can be used not only to slow down flow of velocity but also to distribute flows across a channel to avoid preferential paths and guide flows toward vegetation.

Selection Criteria:

The Check Dams will store surface run- off water flowing during monsoon period and also to recharge the ground water. Hence during selection of locations for construction of check dams the following principles and priorities are to be followed:

- The works identified and approved by the Grama Sabha shall be taken up for preparation of DPR on priority basis.
- Hydrological and technically feasible sites may be considered in consultation with Central Ground Water Board officials and Local Farmers views may also taken in to consideration. The main emphasis shall be focused on selection of the site for the proper use of water through people's participation.
- Local need and demand for irrigation water
- The sites for construction of Check dams shall be selected after detailed survey and field investigations.
- The site selected for check dam should have sufficient thickness of permeable soil or weathered material to facilitate recharge of stored water within a short span of time.
- The area selected should have gentle slope.
- The water spread area of one check dam overlapping another may be avoided.
- The total catchment area of the stream should be normally between 40 to 100 ha. Local situations can, however, be a guiding factor in this regard.
- The rainfall in the catchment should be preferably less than 1000 mm/annum.

- The stream bed should be 5 to 15m wide and at least 1 m deep.
- The downstream side of the bund should not be prone to water logging.
- The downstream area of the Check Dam should have irrigable land under well irrigation.
- The Check dams should preferably be located in areas where proper bunds are available.

Planning:

- The MGNREG Scheme in convergence with PMKSY and IWMP have taken up Water Conservation and Management, Soil and Moisture Conservation, Ground Water Recharge, Land Development and Common area development works.
- The District Irrigation Plan (DIP) is prepared as per the guidelines issued in the new Master Circular for the year 2017-18, which supersedes the earlier guidelines issued by the MoRD, Government of India and also as per SAMARTHYA Technical Training Manual issued by MoRD, Gol and the book on brief description on permissible works under MGNREGS issued by MoRD, Gol.
- The Annual Action Plan / Labour Budget for MGNREGS is duly incorporated in the DIP in which 65% of the expenditure under MGNREGS is on Natural Resource Management works for the year 2017-18, in the 200 over exploited and critical blocks.
- The District Irrigation Plan (DIP) has been prepared after inclusion of Mission Water Conservation works and handed over to Tamil Nadu Watershed Development Agency (TAWDEVA) for preparation of State Irrigation Plan (SIP).
- The Strategic Action Plan (SAP) for seven years for the MGNREGS component has been worked out from 2016-17 to 2022-23, incorporating the Water Conservation works as per the operational guidelines of Mission Water Conservation (MWC), for inclusion in the State Irrigation Plan (SIP).
- Tentative targets for the districts has already been communicated and shelf of project is prepared as per the District target as envisaged in the Annual Action Plan.
- As per the Master Circular issued by MoRD, Government of India, the 60:40 ratio in Wage and Labour is maintained at District level for all the works planned to be implemented by the Village Panchayat and not at Village Panchayat level.
- The works identified and approved by the Grama Sabha shall be taken up for preparation of DPR on priority basis.

- The Integrated Watershed Management Programme (IWMP) may not be implemented in all the blocks but through the implementation of MGNREGS in all Districts, we are constructing Concrete check dams, Gabion check dams and Boulder check dams in all water stressed, critical and over exploited in which IWMP may not be implemented.
- In whichever block IWMP is implemented, technical expertise may be sought from IWMP for construction of check dams.

Construction methodology and Design:

- The check dam shall be constructed using cement concrete.
- The length of check dam will be fixed as per available stream width or upon known discharge quantity.
- Minimum free board considered over maximum water level to be 0.3m.
- The structure may be designed based on the 10 years of rainfall data and maximum flood levels.
- The Depth of foundation will be fixed where hard stratum is available or below maximum scour level.
- The Flexible / Rigid apron shall be provided on the downstream side of the check dam.
- Generally no aprons are required on the upstream side of the weir. However, it is desirable to provide puddle clay apron to control excessive seepage below the dam wall.
- Length of the wing walls must be enough to completely encase the stream / canal bund. Normally, the upstream and downstream side wing wall may be splayed generally at 1 in 3 and 1 in 5 respectively.
- Surplus arrangement should be made
- The newly constructed structure should not have any adverse impact on the hydrological efficacy of the existing, ongoing and future major, medium, minor (flow) irrigation and minor (lift) irrigation projects.

Institutional Arrangement and Monitoring Mechanism:

- This work will be executed using MGNREGA labour.
- The skilled labour and the material cost involved shall be met from the material component of MGNREGS.

- The labour payment will be made on weekly basis. Material component will be paid as per the guidelines of GOI.
- The Rural Schedule of Rates finalized in G.O.(Ms).No.45, RD&PR(CGS.1) Dept., Dated 03.04.2017 shall be adopted. In case of any revision in the RSoR in future the same shall be adopted.
- Photographs shall be taken before execution, during execution and after completion of work.
- Citizen Information Board shall be kept at the work site in the size 4X3 feet for common works at a cost of Rs.4500/ board with all necessary information as per the framework given by the GOI vide No: K11023/1/1/2017- MGNREGSA(IV), MoRD, Dated 07.04.2017. The cost of the information board shall be included in the estimate itself.
- Geo tagging of the assets should be done immediately after completion of the work.
- For selection of site, a committee consisting of AE, BDO (V.P) and one official from IWMP/TAWDEVA and these committee shall inspect every site and select the location of check dam and type of check dam according to the site condition.
- For selection of the suitable site Water Delineation Map/Watershed Atlas available with IWMP/TAWDEVA officials/ DT members, shall be used as a tool.
- Technical guidance may be obtained from IWMP/TAWDEVA in the District.
- All the work site should have MGNREGS Work File (Checklist /Contents) as per the instructions of GoI, vide Ref No.J-11017/6/2016 -MGNREGA- VII (Part) MORD, dated 19.07.2017.

HANS RAJ VERMA
ADDITIONAL CHIEF SECRETARY TO
GOVERNMENT

// TRUE COPY //

W. Cyg
5/11/18
SECTION OFFICER

Sharma
5/11/18