

कार्यालय प्रमुख अभियन्ता एवं विभागाध्यक्ष, लोक निर्माण विभाग उत्तराखण्ड देहरादून

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पत्रांक : 1342/10अधीक्ष/प्र/13

दिनांक : 27/9/13

लोक निर्माण विभाग उत्तराखण्ड में Road Side Drains के निर्माण में एकरूपता लाने के लिए निम्नानुसार आदेश पारित किए जाते हैं :-

(i) Specifications for Rural Roads के Clause संख्या 1606 एवं IRC SP-20 के Clause संख्या 6.5.2.1 के अनुसार सभी मार्गों पर सामान्यतः केवल Kerb and Channel (K-C) Type Drain का ही प्राविधान किया जाएगा।

(ii) जिन मार्गों/स्थानों पर उपरोक्त के अतिरिक्त किसी अन्य प्रकार की Drain बनाने की आवश्यकता प्रतीत हो, वहाँ सम्बन्धित अधीक्षण अभियन्ता के स्थल निरीक्षण के उपरान्त दिए गए अनुमोदन के आधार पर उचित Road Side Drain का निर्माण किया जाएगा।

सुलभ संदर्भ हेतु Kerb & Channel Drain एवं अन्य प्रकार की Drains की Standard Drawings तथा उपरोक्त वर्णित Clauses की प्रतिलिपि संलग्न हैं।

प्रमुख अभियन्ता
लोक निर्माण विभाग देहरादून

प्रतिलिपि निम्न को सूचनार्थ प्रेषित :-

1. प्रमुख सचिव, वित्त उत्तराखण्ड शासन।
2. प्रमुख सचिव, लोक निर्माण विभाग उत्तराखण्ड शासन।
3. ²⁹अधीक्ष सचिव, लोक निर्माण विभाग उत्तराखण्ड शासन।
4. मुख्य अभियन्ता गढ़वाल/कुमायूँ क्षेत्र/ए0डी0बी0 /नियोजन लो0नि0वि0, पौड़ी/अल्मोड़ा/देहरादून।
5. समस्त अधीक्षण अभियन्ता, (सिविल) लोक निर्माण विभाग उत्तराखण्ड। अधीक्षण अभियन्ता अपने स्तर से अधिशासी अभियन्ताओं को उपलब्ध कराना सुनिश्चित करें।
6. अधिशासी अभियन्ता टी0ए0सी0 वित्त विभाग, उत्तराखण्ड शासन।
7. वरिष्ठ स्टाफ आफिसर I, II/अधिशासी अभियन्ता I, II, III, IV, V, VI कार्यालय मुख्य अभियन्ता स्तर-I, लो0नि0वि0 देहरादून।
8. कनिष्ठ अभियन्ता (प्रो), कार्यालय विभागाध्यक्ष, लोक निर्माण विभाग, देहरादून।

संलग्न : उपरोक्तानुसार


प्रमुख अभियन्ता
लोक निर्माण विभाग देहरादून

8.4.2. Roadside drains should generally be of uniform section throughout irrespective of the location of road on the hill slope. Road on ridge alignment may not require the same section of drains due to lesser quantity of flow of water. For convenience of construction, it may be necessary to have uniform section of a drain but the frequency of culverts could be regulated to the catchment area that has to cater to.

8.4.2.1. Roadside drains are constructed to parabolic (Saucer shape), trapezoidal, triangular, V-Shape, kerb and channel or U-Shaped cross-sections. The parabolic section is hydraulically the best and most erosion resistant. The trapezoidal section is easier to construct and is more generally used. Kerb and channel drain gives extra width in case of emergencies for vehicles to use. U-Shaped drains are generally deep drains and are provided where higher discharge has to be catered and adequate road width is available.

8.4.2.2. Generally drains are made of size 60 cm x 60 cm and should have a gradient of 1:20 to 1:25 to develop self cleansing velocity to disperse floating debris conveniently. In continuous long stretches of road with steep grades, the road side drains should be stepped to break the velocity. A 0.6 m high toe wall along the hill side will be required to prevent erosion of hill-slope-as an integral part of side drain. In U-Shaped drain, road side edge should be provided with guide stones (duly white washed) to maintain distance of vehicles for safety.

8.4.2.3. Fig. 8.2 gives details of various types of side drains and their arrangements as described in preceding paras.

8.4.2.4. To discharge runoff from hill side drain to valley side, 8 to 10 culverts or scuppers can be provided per km or the side drains may be connected to discharge into natural water course.

8.5. Catch-Water Drains/Intercepting Drains

8.5.1. Such drains are provided on hill slopes to intercept water flowing from upper reaches and guide such flow into culverts. These drains should be trapezoidal shape and should be at least stone lined and cement pointed. Catch water drains must carry the intercepted water to the nearest cross-drainage point and it should be well cleaned and repaired before the onset of every monsoon.

8.5.2. Such catch-water drains should be provided in stable hill slopes outside the periphery of slide/unstable areas so that stability of hill is not further worsened. In such cases, additional intermediate drains may also have to be provided in some cases depending on ground conditions. Figs. 8.3 & 8.4 depict catch-water drain arrangement on a stable hill slope and in a slide area.

8.6. Chutes

8.6.1. Surface run off on a hill slope generally flows down in the form of natural gulleys/chutes. The water entrapped in the catch water drains is also brought down either by connecting them with existing natural gulleys or through specially provided chutes. The cumulative discharge with its increasing momentum causes immense erosion. It is, therefore, desirable to provide lined chutes to lead the discharge to the catch pit of culvert or to a natural drainage channel (Fig. 8.5). Box type stepped chutes of stone masonry have been found more appropriate because of their stability and long life. A typical section is given in Fig. 8.6.

8.7. Pavement Drainage

8.7.1. Drainage problem may be considered in two-categories, surface and sub-surface. Surface drainage or in other words, pavement drainage includes the disposal of all water present on the surface of the pavement and adjacent ground.

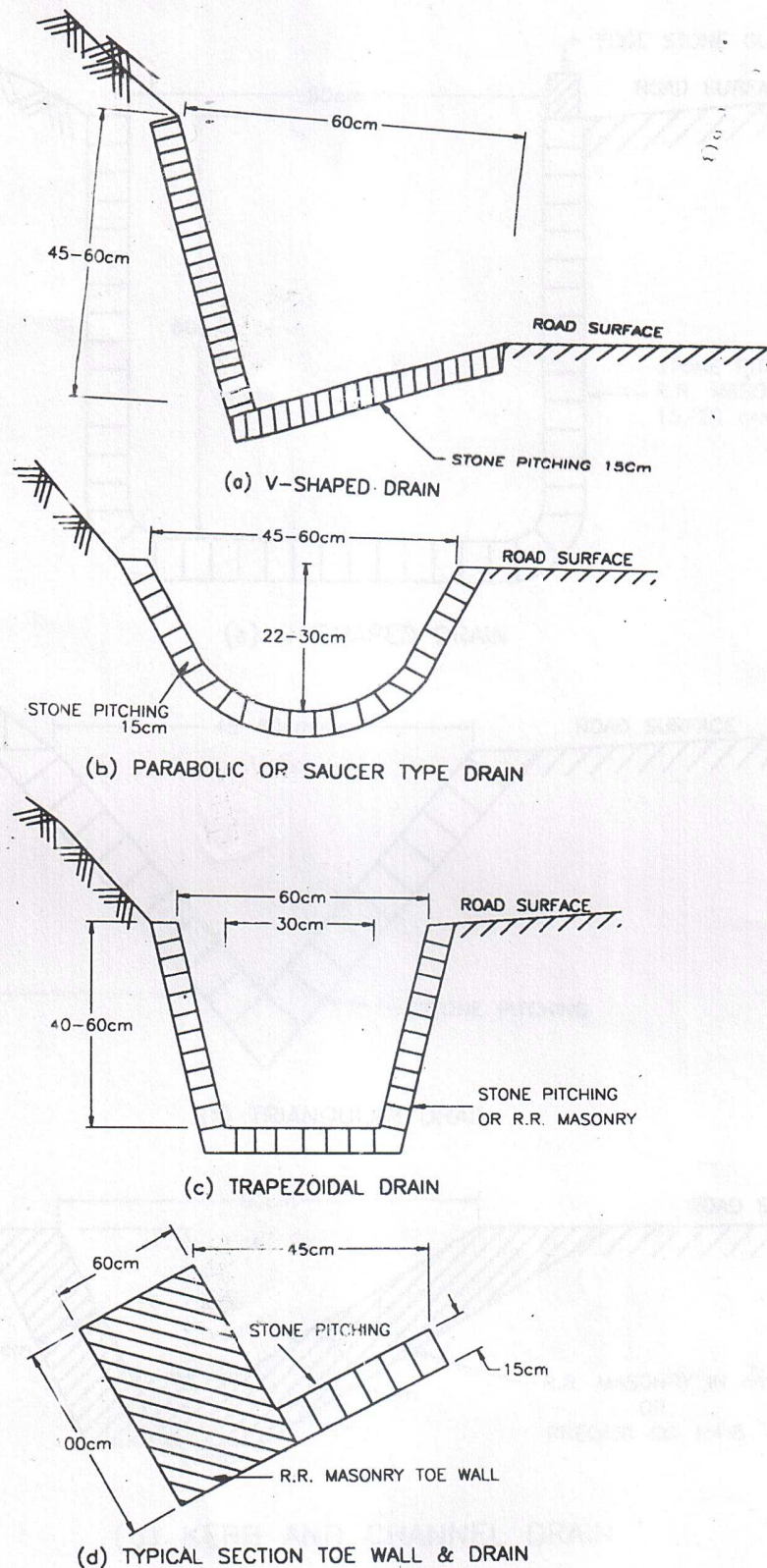
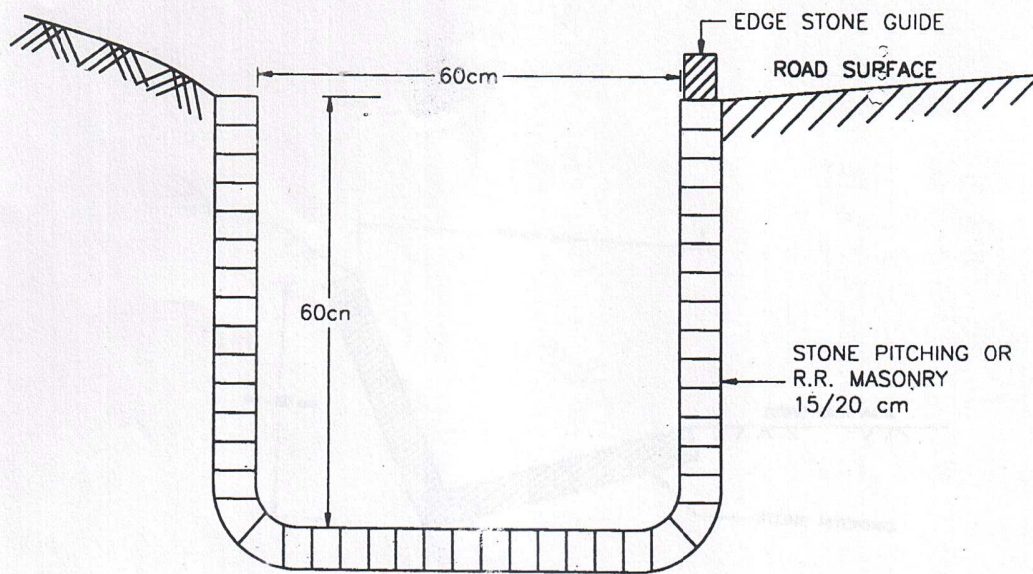
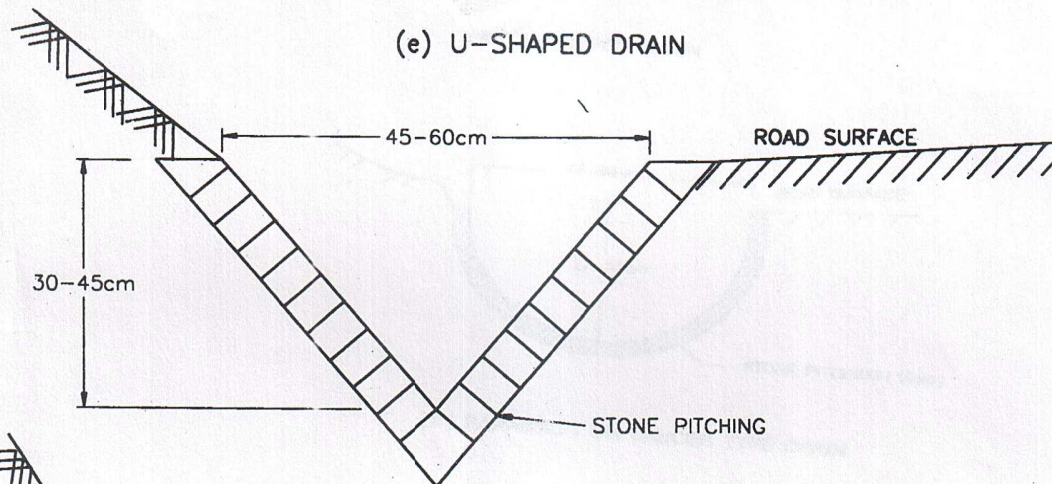


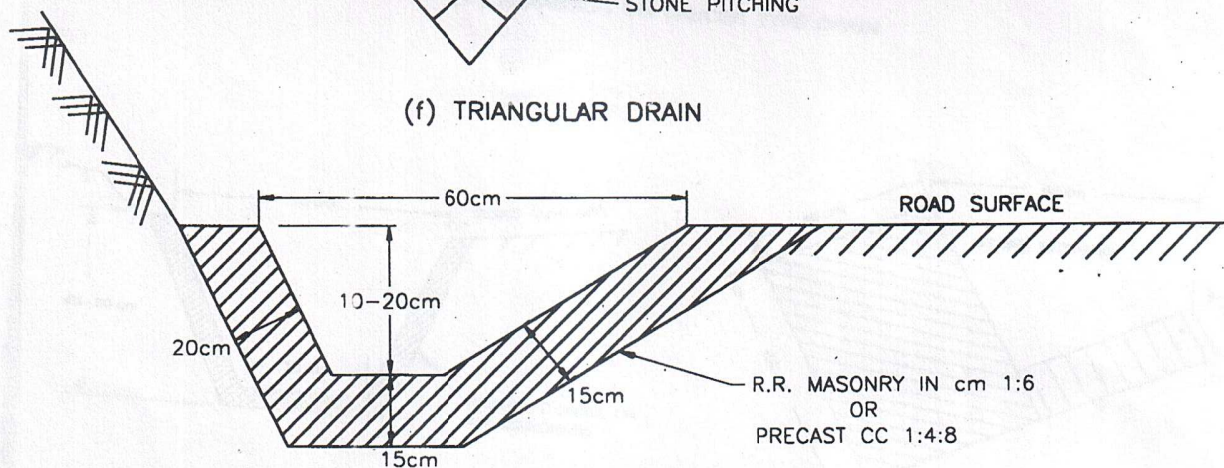
FIG. 8.2. SIDE DRAINS



(e) U-SHAPED DRAIN

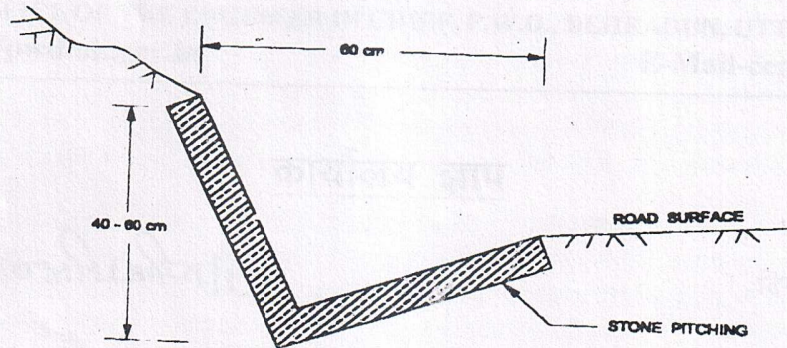


(f) TRIANGULAR DRAIN

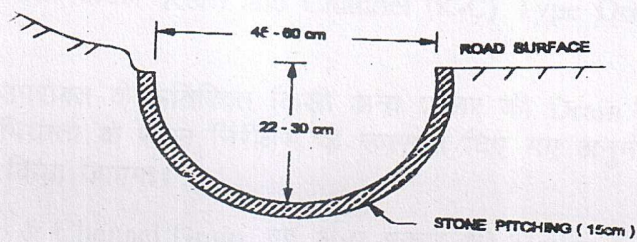


(g) KERB AND CHANNEL DRAIN

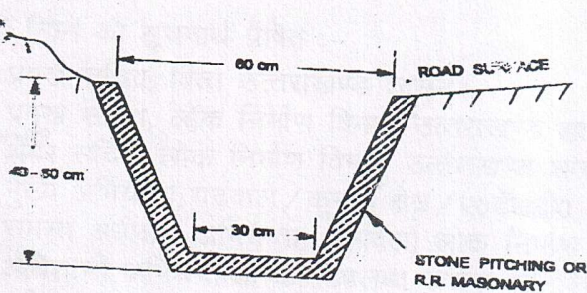
FIG. 8.2. SIDE DRAINS



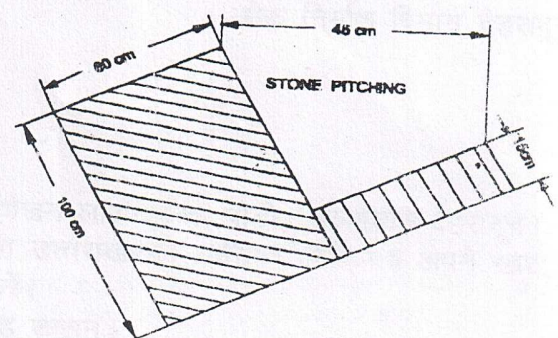
(a) V-SHAPED DRAIN



(b) PARABOLIC OR SAUCER TYPE DRAIN

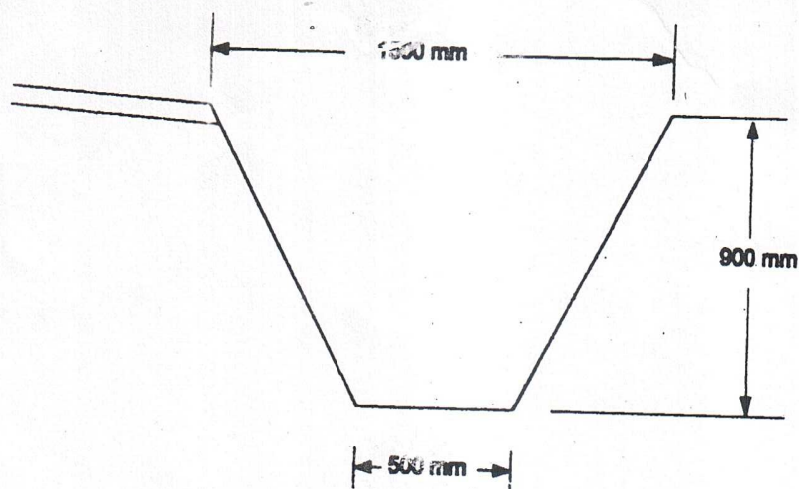


(c) TRAPEZOIDAL DRAIN

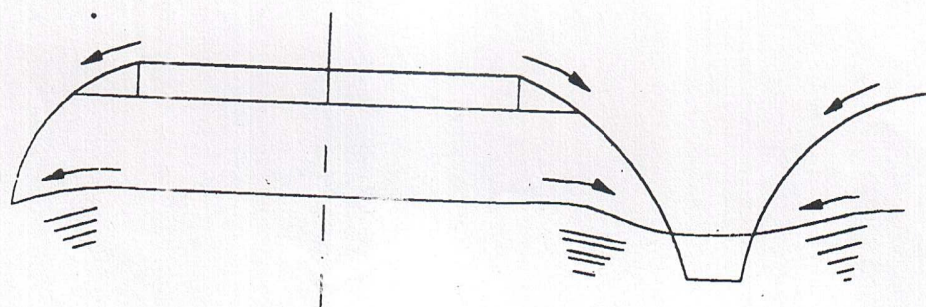


(d) TYPICAL SECTION OF TOE WALL AND DRAIN

Fig. 2. Side Drains



(a) Typical Cross-Section of Side Drain in Soil



(b) Function of Side Drains

Fig. 6.1. Cross-Section and Function of Side Drains

The side drains are designed on the principles of open channel flow, and generally provided on both sides of the road. In case of hilly terrain, side drains on hillside are made when road is built in cut section. They should be provided below the subgrade of the road.

Roadside drains in hilly terrain are constructed to parabolic (saucer shape), trapezoidal, triangular, V-shape, kerb and channel or U-shaped cross-sections. The parabolic section is hydraulically the best and most erosion resistant. However, the trapezoidal section is easier to construct and is generally adopted. U-shaped drains are generally deep drains and are provided where higher discharge has to be catered and road width is available. Extra width will be available when kerb and channel drains are provided. Details of various types of side drains are shown in Figs. 6.2 and 6.3.