

this. In walls over three feet in thickness, headers will be built in front and back alternately, and great care must be taken in the arrangement of the joints so as to give perfect bond.

Culvert
masonry
general description.

49. Culvert Masonry shall be built of good, sound, large flat-bedded stones, laid in horizontal beds. It may be known as Random, or broken coursed work. The stones employed in this class of masonry will generally be not less in area of bed than three superficial feet, nor less in thickness than eight inches, and they must be dressed so as to give good beds with half-inch joints. In smaller structures, and in cases where stones of good size and thickness cannot be had, they may, if in other respects suitable, be admitted as thin as five inches. All stones must be laid on their natural beds.

Headers and
stretchers.

50. Headers shall be built in the wall, from front and back alternately, at least one in every five feet in line of wall, and frequently in the rise of wall. In the smallest structures headers shall not be less than twenty-four inches in length, and the minimum bed allowed for stretchers shall be twelve inches. In the larger structures all stones must be heavier in proportion. Every attention must be paid to produce a perfect bond, and to give the whole a strong, neat, workmanlike finish.

Coping and
covering.

51. Wing walls will generally be finished with steps, formed of sound durable stone, and not less than from 10 to 12 inches thick, and 6 feet superficial area; other walls will be covered with coping of a similar thickness, and of seven feet or upwards, superficial area. These coverings will be neatly dressed when required, and as may be directed. The walls of the box culverts will be finished with stones the full thickness of wall, and the covers will be from 10 to 15 inches thick, according to the span; they must have a bearing of at least 12 inches on each wall, and they must be fitted sufficiently close together to prevent the earth from falling through.

Paving.

52. The bottoms of culverts will be paved with stones set on edge, to a moderately even face, packed solid, the interstices being also well packed. The paving will be from 9 to 12 inches deep.

Mortar.

53. Mortar shall be of hydraulic lime or cement, and common lime.

Cement.

54. Hydraulic lime mortar will be used unless otherwise directed in building all masonry, from the foundations up to a line two feet above the ordinary level of the stream. It will be used also in laying girder beds, coping, covering of walls generally, in lipping and in pointing. The hydraulic lime or cement must be fresh ground, of the best brand, and it must be delivered on the ground, and kept till used in good order. Before being used, satisfactory proof must be afforded the Engineer of its hydraulic properties, as no inferior cement will be allowed.

Common
lime.

55. Common lime mortar must be made of the best common lime and will be employed in all masonry (except dry) where cement is not directed to be used.

Mortar how
made

56. Both cement and lime must be thoroughly incorporated with approved propo