

Mortar joints shall not exceed three-quarters ( $\frac{3}{4}$ ) of an inch in thickness. All corners and quoins shall have hammered dressed beds and joints. All corner and batter lines to be run to a neat line. The vertical joints of the face must be in contact at least eight (8) inches, measured in from the face, and as much as the stone will admit of. The work need not be laid up in regular courses, but shall be well bonded. The stone shall be cleaned and dampened before setting, and shall be laid in cement mortar. Bridge seats and tops of wall are to be coped in the same manner as specified for the first-class masonry. Stones in foundation courses shall not be less than twelve (12) inches in thickness and contain not less than twelve (12) square feet of surface.

52. **Third-Class Masonry** will consist of good substantial rubble work, laid in cement mortar; all stones to be perfectly sound, laid on their natural beds and sufficiently large to make good, well-bonded, strong work, and to be laid in the most substantial manner with as much neatness as this description of work admits of. The stones in the foundations must be not less than ten (10) inches in thickness, and shall contain not less than ten (10) square feet of surface, and each be firmly, solidly and carefully laid.

53. **Dry Masonry.**—Box culverts shall be of good rubble masonry, neatly laid up dry with square shaped stones of a size and quality approved by and satisfactory to the engineer.

When box culverts are ordered to be laid up in cement mortar, they will be classified as third-class masonry, and must conform to the specifications for the same. The covering stone for all box culverts shall be not less than ten (10) inches in thickness for two feet culverts, twelve (12) inches for three feet culverts, and fifteen (15) inches for four feet culverts, and must have a good solid, well-levelled bearing on the side wall of not less than fifteen (15) inches for two and three foot culverts or eighteen (18) inches for four (4) foot culverts. Side walls for masonry box culverts will be of a thickness directed by the engineer.

54. **Drain Pipes.**—When so ordered by the engineer sizes of twelve, eighteen and twenty-four (12, 18 and 24) inch diameter may be used and the quality must be the best double strength, vitrified pipe, subject to the approval of the engineer. Drain pipes must be well and carefully bedded and laid in accordance to the instructions of the engineer.

55. **Retaining Walls.**—Retaining walls will be classified as second or third-class masonry laid dry, as may be ordered in each particular case.

56. **Stone Paving.**—Paving for culverts and other water courses will be made by setting stone on edge from eight (8) to fifteen (15) inches in depth, laid either dry or grouted with strong cement mortar as may be directed by the engineer.

57. **Pointing.**—All masonry must be neatly pointed with cement mortar in proportions of one of sand to one of cement.

#### Foundations.

58. **Excavations.**—Foundations for masonry shall be excavated to such level depths as may be necessary to secure a solid bearing for the masonry of which the engineer shall be the judge.

59. **Classification of Material Excavated.**—The material excavated will be classified and paid for as provided for in these specifications, under the head of excavations and foundations. This does not include box culverts or timber bridge foundations.

60. **Artificial Foundations.**—When a safe and solid foundation for masonry cannot be found at a reasonable depth (to be judged by the engineer) there will be prepared by the contractor such artificial foundations as the engineer may direct.

61. **Excavated Material Deposited.**—All material taken from excavations for foundations, if of proper quality shall be deposited in the contiguous embankments, but any material unfit for such purpose shall be deposited outside the roadway or in such place as the engineer shall direct, and so that it shall not interfere with any drain or water course.

62. **Timber Foundations.**—Timber foundations when required shall be such as the engineer may by drawing or otherwise describe and will be paid for per thousand feet board measure, as timber in foundations. The price covering cost of material, manufacture and placing in the work according to plans and directions.

All timber for foundations must be sound, straight-grained pine or hemlock, free from sap and defects that would impair its strength or durability. It must be sawn straight and to full dimensions with full corners and square edges; all framing must be done in a thoroughly workmanlike manner, and both material and workmanship shall be subject to the inspection and acceptance of the engineer.

63. **Cofferdams and Concrete in Foundations.**—Where cofferdams are in the opinion of the engineer necessary the prices provided for timber, piles, and iron in foundations will be allowed for the material and work of placing same, which is understood as covering all risks from high water and otherwise and draining, bailing and pumping, and all other material and labor connected with the cofferdam.

Detailed plans for such work, including caissons, should any be required, will be furnished by the engineer. Where concrete is used in foundations it shall be of the quality specified under specifications for concrete attached, all in accordance with the plans and special instructions furnished by the engineer.

64. **Excavations in Foundations.**—Excavations in foundations other than box culverts and timber bridges, will be classified as follows:

- Earth excavated dry, per cubic yard.
- Loose rock excavated dry, per cubic yard.
- Solid rock excavated dry, per cubic yard.
- Earth excavated in water, per cubic yard.
- Loose rock excavated in water, per cubic yard.
- Solid rock excavated in water, per cubic yard.

#### Timber Structures.

65. **To be Built to Plans.**—All structures must be built in strict accordance with the general or special plans.

66. **Timber.**—All timber must be of the best description of the kind required. It must be sawn square and to proper dimensions. It must be free from all loose, large, or unsound knots, sap, sun cracks, shakes, waness, or other imperfections or defects which would impair its strength or durability.

The timber used for each portion of the structure must be cut from wood, as specified or approved by the engineer.

67. **Clearing Ground.**—Before commencing work on any wooden structure, the ground must be entirely cleared of logs, brush and trees for the whole of the width of the right of way, and during the progress of the work, all pile and timber ends, chips and brush, shall be cleared from around the structure and burnt, or otherwise disposed of as the engineer may direct.

68. **Framing.**—No shimming will be permitted. Great care must be taken in framing all timber structures, to insure a perfect fit at all joints. At the completion of the work they must be left in perfect line and surface.

69. **Erection of Bridges Ahead of Track.**—Bridges must be erected ahead of the track in all cases where not specially excepted, but the maximum distance beyond the end of track to which the contractor shall be required to haul material without extra payment, shall not exceed four miles.