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Culvert design excel spreadsheets

By Erica Sweeney Using Microsoft Excel to keep track of invoices is a great way to stay organized. You can make spreadsheets in Excel to track invoices you have sent out and when you are paid for them—or, on the other hand, when you receive invoices and pay them. No matter your reasons for needing an invoice spreadsheet, setting one up in Excel is fast and easy. You will simply need to create and format a few columns and enter your data. And of course, don't forget to save the file. The same process can be used to set up an invoice spreadsheet in either Excel 2003 or Excel 2007. Open Microsoft Excel. A blank spreadsheet will open, and you will notice that predetermined rows and columns are already set up. Enter a title at the top of the spreadsheet. Start typing your title into cell A1. Having a clear and specific title for the spreadsheet will help you remember what invoices are on a particular spreadsheet. Perhaps you need separate spreadsheets for invoices received and invoices sent out. Bold the title by clicking on the cell and using the bold tool on the top toolbar. Set up column headings a few lines down from the title. Begin entering column headings in column A. Some helpful column headings include Invoice Date, Invoice Number, Person or Company being invoiced, Invoice Amount, Date Received, Date Paid and others depending on your exact purpose for the invoice spreadsheet. Bold and center the column headings. Click on the number to the left of the row where the column headings are entered; the entire row will be selected. Use the tools on the top toolbar to bold and center the column headings. Enter data into the spreadsheet. Be sure to plug everything into the appropriate column. If you are missing a piece of information, simply leave the cell blank. Format cells that contain numbers so that all of the numbers in the column look the same. To format cells, highlight all of the cells that have the same types of numbers in them, such as amounts. Then right-click on the highlighted cells and select "Format Cells." In the box that opens up, click on the "Number" tab. Click "Currency" in the "Category" box to format all cells that contain amounts in the same way. Then choose how many decimal places you want to include and click "OK." You can also format dates, ZIP codes, phone numbers and other data. Select these options from the "Category" box—if you don't see something listed there, it is most likely listed under "Special." Add totals to the spreadsheet. To do this, click in the cell where you want the total to be located. Click on the sigma symbol (it looks sort of like a capital E) on the top toolbar. Click on the first cell to be included in the total, then drag down until the last cell to be included is selected. The cells will be outlined in a moving-dashed box. Press the "Enter" key and the total will be inserted. DOCUMENT NO : JI-187A-SA3-20-ECV-CAL-005 Revision No. : A DESIGN CALCULATIONS FOR CULVERT 6.0 DESIGN OF PRECAST TOP COVER Design Data Top of road = TOR = 2.45 m Invert level of culvert = IL = 0.75 m Clear span = L = 6000 mm Thickness of wall = Tw = 400 mm Thickness of base slab = Tbs = 500 mm Effective span of top cover slab = Le = 6400 mm Thickness of top cover slab = Tts = 500 mm Characteristic strength of concrete = fcu = 30 N/mm2 Characteristic strength of steel = fy = 360 N/mm2 Depth of soil inside culvert = D = 0.00 m Clear cover = cmin = 25 Coefficient of active lateral earth pressure Ka = 0.42 Coefficient of earth pressure at rest Ko = 0.593 Coefficient of passive lateral earth pressure Kp = 2.37 = 24 kN/m3 mm Soil Data Density of concrete = 18 kN/m3 Safe Bearing Capacity SBC = 300 kN/m2 225 gs 225 Density of soil 6790 TOR 2.450 500 1140 PRECAST COVER SLAB TOC 500 400 6000 400 TYPICAL SECTION OF CULVERT 0.750 DOCUMENT NO : JI-187A-SA3-20-ECV-CAL-005 Revision No. : A DESIGN CALCULATIONS FOR CULVERT = Tts = Dia of main reinforcement bar = f1 = Area of single bar = as = Thickness of top cover slab Effective depth of slab = d = 500 mm 25 mm 490.87 mm2 500 - 25 - 12 - 25 / 2 = 450.50 Effective width of cover slab = Load width + 2.4 x (1 - x / 1) mm CL 3.5.2.2, BS 8110-1 wherex = distance from the nearer support to the section under considered = 3.200 m l = effective span = 6.400 m As per 5.3.2.14. Specification for Civil design Wheel load N = 224 kN This point load is distributed over the tyre contact area 250 mm x 500 mm where, length of contact area width of contact area Hence effective width = = a = 250.00 mm = b = 500.00 mm = 4.34 0.5 + 2.4 (3.2) (1 - 3.2 / 6.4) m when wheel load is at center of the precast panel Effective width when wheel is at edge of the panel = 0.5 / 2 + 4.34 / 2 = m C.L. 3.5.2.2, BS 8110-1 Precast cover slab Vehicle movement Wheel 2.17 b a PART PLAN OF PRECAST COVER Width of Precast panel considered for design = Length of precast panel W = 6790 = 1480 mm For moment mm Load Calculation a) Dead Load Self weight of slab = 1.48 (0.5) 24 = 17.76 kN/m Total dead load = 6.4 (17.76) = 113.67 kN b) Vehicle Load (Live load) Wheel load Total Live load = 224 = kN = 224.00 kN Moment when wheel load is at center = 224 (6.4) / 4 = 358.40 kN.m Moment due to Dead Load = 17.76 (6.4) ^ 2 / 8 = 90.94 kN.m = 763.9 kN.m Total Factored moment Shear when Wheel is at " d " from face of wall Factored Shear = { (113.67 / 2) + (224) } = 280.84 kN = 421.26 kN DOCUMENT NO : JI-187A-SA3-20-ECV-CAL-005 Revision No. : A DESIGN CALCULATIONS FOR CULVERT CALCULATION OF REINFORCEMENT STEEL Width of Precast panel considered for design K = = z = 1480 mm M / b d2 fcu (763.878 x 1000000) / (1480 x 450.5 ^ 2 x 30) 571.90 mm mm (d-Z) = 66.89 mm 0.45 Tension steel required Ast = Nos of bar required = 327 mm2 2 Compression steel required Asc = Nos of bar required Min Ast = 393 mm2 Min Asc = 393 mm2 nos 0 mm2 2 nos Number of Tension reinf. bar provided = 3 nos. Number of compression reinf bar provided = Area of Compression reinf. provided = Total reinforcement provided for bending Asp= 16 dia + 1 16 804 mm2 Area of tension reinf. provided = 4 nos. 804 mm2 1608 mm2 16 dia dia DOCUMENT NO : 1820-SA3-00-ECV-CAL-017 Revision No. : B DESIGN CALCULATIONS FOR CULVERT Design for Shear & Torsion : Diameter of link or stirrup bar = y1 = 560 mm x1 = 375 mm hmax = 650 mm hmin = 465 mm 10 y1 Max. Shear stress developed v =V/bd= = mm x1 0.109 Vertical Shear (45.6) 1000 / (650) (409) = 0.180 N/mm2Horizontal Shear < 8 (fcu)^2 or 5 N/mm2 (Ref.1,CL.3.4.5.2) ptt provided = 0.287 T W (Reinforcements are Indicative Only) % Permissible shear stress,vc= 0.400 N/mm2 vc' = Vh/M = 0.000 K' Compression reinforcement required { Z=d 0. 5 + v (0. 25- K 0. 9 Hence Z = X=)}= 324.15 324.15 (d- Z) = 0. 45 206.33 Tension steel required Ast = 5 Compression steel required Asc = Min Ast = 60 mm2 Min Asc = 0 mm2 2 nos 5 Area of tension reinf. provided = nos. 16 dia + 0 0 dia 1005 mm2 Number of compression reinf bar provided = 5 Area of compression reinf. provided = nos. 16 dia 1005 mm2 Total reinforcement provided for bending Asp= = mm nos 239 mm2 Number of Tension reinf. bar provided = CHECK FOR SHEAR 396.15 mm 952 mm2 Nos of bar required = Nos of bar required mm A culvert is a structure that allows water to flow under a road, railroad, trail, or similar obstruction. Typically embedded so as to be surrounded by soil, a culvert may be made from a pipe, reinforced concrete or other material. A structure that carries water above land is known as an aqueduct. 'Box culverts' includes analyses of all relevant load cases using a stiffness matrix solution with spring supports and compilations of load combination bending moments and shears (at supports and at 'd' from supports)- Culvert data- earth pressure coefficients- loadings- load combinations- buoyancy and sliding checks- analysis of roof, walls and base loading by stiffness matrix- partial factors- design moments- design shearsClick here to download excel worksheet1.Box culvert design materials 2.Box culvert design geometry3.Box culvert design loads4.Box culvert design analysis5.Box culvert design wall6.1.Box culvert design slab7.Box culvert design drawing SNRN 9/25/2020 Admin Bandung Indonesia SNRN Friday, 25 September 2020 A culvert is a structure that allows water to flow under a road, railroad, trail, or similar obstruction. Typically embedded so as to be surrounded by soil, a culvert may be made from a pipe, reinforced concrete or other material. A structure that carries water above land is known as an aqueduct. 'Box culverts' includes analyses of all relevant load cases using a stiffness matrix solution with spring supports and compilations of load combination bending moments and shears (at supports and at 'd' from supports)- Culvert data- earth pressure coefficients- loadings- load combinations- buoyancy and sliding checks- analysis of roof, walls and base loading by stiffness matrix- partial factors- design moments- design shearsClick here to download excel worksheet1.Box culvert design materials 2.Box culvert design geometry3.Box culvert design loads4.Box culvert design analysis5.Box culvert design wall6.1.Box culvert design slab7.Box culvert design drawing 9:16 PM design Excel Sheets concrete box culverts are available with spans varying from 6 to 16 feet and rises varying from 4 to 14 feet. Standard precast concrete box culverts are typically fabricated in 6 foot sections; however larger boxes are fabricated in 4 foot sections to reduce section weight. The designs utilize concrete strengths between 5 and 6 ksi and are suitable for fill heights ranging from less than 2 feet to a maximum of 25 feet. Box culverts outside of the standard size ranges must be custom designed.Each culvert size has three or four classes. Each class has specified wall and slab thicknesses, reinforcement areas, concrete strength, and fill. LINK Related Resources: excel calculators Excel Downloads Requires Microsoft Excel or Apache Open Office. Check file for version requirements. (Annual Premium Membership Required for Download). Read Me: About Engineers Edge Applications Excel Spreadsheet Downloads Engineering Excel Spreadsheet Downloads This excel spreadsheet Culvert Design Calculates capacity of circular culverts based on culvert material, inlet type, diameter, and length. Analysis is also based on water and culvert elevation. Includes a Help tab. . Download: Culvert Design Excel Spreadsheet © Copyright 2000 - 2021, by Engineers Edge, LLC www.engineersedge.com All rights reserved Disclaimer | Feedback | Advertising | Contact Date/Time: Leon HoFounder of Lifehack Read full profile Share Pin it Tweet Share Email Matt Evans has shared his library of excel spreadsheets which should help you calculate and analyze different data. It may save you time on designing spreadsheets. Popular ones within the list include: Capital Budgeting Analysis (xls) - Basic program for doing capital budgeting analysis with inclusion of opportunity costs, working capital requirements, etc. NPV & IRR (xls) - Explains Internal Rate of Return, compares projects, etc. Free Cash Flow (xls) - Cash flow worksheets - subsidized and unsubsidized. Balanced Scorecard - Set of templates for building a balanced scorecard. Excel Workbook 1-2 - Set of worksheets for evaluating financial performance and forecasting Free Excel Spreadsheets - [Matt H. Evans] Share Pin it Tweet Share Email you are here Accueil | RESOURCES | Excel Sheets Templates | Concrete Box Culvert analysis and Design Spreadsheet 4 January 2018 A culvert is a structure that allows water to flow under a road, railroad, trail, or similar obstruction. Typically embedded so as to be surrounded by soil, a culvert may be made from a pipe, reinforced concrete or other material. It's a structure that carries water above land is known as an aqueduct. Download Link error: Content is protected !!

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