

# ISO 28842:2013-06 (E)

## Guidelines for simplified design of reinforced concrete bridges

---

<b>Contents</b>		<b>Page</b>
Foreword .....		v
Introduction .....		vi
<b>1</b>	<b>Scope .....</b>	<b>1</b>
<b>2</b>	<b>Normative references .....</b>	<b>1</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>2</b>
<b>4</b>	<b>Symbols and abbreviated terms .....</b>	<b>13</b>
<b>5</b>	<b>Design and construction procedure .....</b>	<b>18</b>
<b>5.1</b>	<b>Procedure .....</b>	<b>18</b>
<b>5.2</b>	<b>Design documentation .....</b>	<b>20</b>
<b>6</b>	<b>General Guides .....</b>	<b>20</b>
<b>6.1</b>	<b>Limitations .....</b>	<b>20</b>
<b>6.2</b>	<b>Limit states .....</b>	<b>23</b>
<b>6.3</b>	<b>Ultimate limit state design format .....</b>	<b>25</b>
<b>6.4</b>	<b>Serviceability limit state design format .....</b>	<b>26</b>
<b>7</b>	<b>Structural systems and layout .....</b>	<b>26</b>
<b>7.1</b>	<b>Description of the components of the structure .....</b>	<b>26</b>
<b>7.2</b>	<b>General program .....</b>	<b>27</b>
<b>7.3</b>	<b>Structural layout .....</b>	<b>28</b>
<b>7.4</b>	<b>Feasibility under the guidelines .....</b>	<b>29</b>
<b>8</b>	<b>Actions (Loads) .....</b>	<b>30</b>
<b>8.1</b>	<b>General .....</b>	<b>30</b>
<b>8.2</b>	<b>Dead loads .....</b>	<b>30</b>
<b>8.3</b>	<b>Live loads .....</b>	<b>31</b>
<b>8.4</b>	<b>Longitudinal forces .....</b>	<b>33</b>
<b>8.5</b>	<b>Earth pressure .....</b>	<b>33</b>
<b>8.6</b>	<b>Wind loads .....</b>	<b>34</b>
<b>8.7</b>	<b>Earthquake inertial forces .....</b>	<b>34</b>
<b>8.8</b>	<b>Thermal Forces .....</b>	<b>44</b>
<b>8.9</b>	<b>Load combinations .....</b>	<b>46</b>
<b>9</b>	<b>Design requirements .....</b>	<b>46</b>
<b>9.1</b>	<b>Scope .....</b>	<b>46</b>
<b>9.2</b>	<b>Additional requirements .....</b>	<b>46</b>
<b>9.3</b>	<b>Materials for structural concrete .....</b>	<b>47</b>
<b>9.4</b>	<b>Concrete Mixture Proportioning .....</b>	<b>48</b>
<b>9.5</b>	<b>Development length, lap splicing and anchorage of reinforcement .....</b>	<b>57</b>
<b>9.6</b>	<b>Limits for longitudinal reinforcement .....</b>	<b>59</b>
<b>9.7</b>	<b>Minimum amounts of transverse reinforcement .....</b>	<b>62</b>
<b>10</b>	<b>Superstructure .....</b>	<b>66</b>
<b>10.1</b>	<b>Strength of members subjected to flexural moments .....</b>	<b>66</b>
<b>10.2</b>	<b>Strength of members subjected to shear stresses .....</b>	<b>72</b>
<b>10.3</b>	<b>Decks .....</b>	<b>76</b>

10.4	Solid slabs supported on girders, beams, or joists .....	83
10.5	Girders, beams and joists .....	103
10.6	Railings .....	119
11	Substructure .....	120
11.1	Girders that are part of a frame .....	120
11.2	Strength of members subjected to axial loads with or without flexure .....	128
11.3	Torsion .....	132
11.4	Bearing strength .....	133
11.5	Columns and Piers .....	133
11.6	Concrete walls .....	142
12	Foundations .....	150
12.1	Foundation type and capacity .....	150
12.2	Subsurface exploration and testing programs .....	151
12.3	Dimensioning of the foundation elements .....	151
12.4	Footings .....	151
12.5	Foundation mats .....	153
12.6	Footings on piles .....	153
12.7	Foundation beams .....	154
12.8	Retaining Walls .....	154
13	Lateral load resisting system .....	163
13.1	General .....	163
13.2	Specified lateral forces .....	164
13.3	Lateral force resisting structural system .....	164
13.4	Minimum amount of structural concrete walls .....	164
13.5	Special reinforcement details for seismic zones .....	165
14	Bearings .....	176
14.1	General .....	176
14.2	Multiple roller bearings .....	176
14.3	Elastomeric bearings .....	177
14.4	Anchorage .....	179
14.5	Design forces for supporting structure .....	179
	Annex A (normative) Equivalent equations for material factors .....	181
	Annex B (normative) Beam Deflection .....	186
	Bibliography .....	187