

## INDEX

*Note:* CRS = Cable reinforcement set

**Abutments**

- Capacity, 31
- Condition, 36
- Excavation of (for deck-type bridge), 138
- Prepared, 36
- Unprepared, 36-37

**Access routes (to bridge), 31****Adapter (CRS), 174****Anchor line pull, 173-175****Anchorage, 273****Anchors, *See* Anchorage****Approach guides, 112****Approach roads, 31, 263-265****Assembly party. *See* Work parties****Assembly sites, 31-32****Assembly times, 35****Backspace, 235-237****Bailey bridge M1, 2****Bailey bridge M2**

- Advantages, 2
- Damage assessment, 279
- Damage evaluation, 281-283
- Destruction, 292-293
- Dismantling, 284
- Expedient widening, 286
- History, 2
- Maintenance detail, 278
- Parts composition, 2
- Replacing, 284
- Stories added, 2

**Bailey bridge M3. *See* Extra-widened Bailey bridge M3****Bank(s)**

- Condition of, 31
- Height(s), 3, 37
- Qualities needed, 31, 264
- Slope, 45

**Barges, *See also* Bridges on barges**

- Anchoring, 275
- Capacity, 258-259, 263
- Design, 258-259
- Equipment, 263

**Loading methods, 266-268**

- Ribs, 259, 266
- Selection and processing, 263, 265-266

**Base plate(s)**

- Bridge ends on, 87
- Description, 12
- Height, 58
- Location, 2, 12
- Positioning of (landing bay), 270
- Roller layout and, 135
- Single-story M3 bridge and, 135
- Use (general), 12

**Bay load, 29****Bearings**

- Converting single- to two-lane bridge, 124-125
- Crib, 211
- Deck-type bridge rocker, 138, 140-141
- Description, 2, 12
- Landing-bay, 270
- Location, 2
- Railway-bridge rocker, 148, 150
- Single-story bridge jacking, 87
- Storage and transport, 278
- Use (general), 12

**Bivouac site, 31****Blackout conditions. *See* Night driving****Block and tackle**

- End-on assembly, 241
- Movable platforms and, 235
- Special spans and, 261, 263
- Underslung story added with, 111

**Bolts (CRS), 175****Brace-connection fixtures (CRS)**

- Description, 168
- Installation, 177-178, 183
- Removal, 187
- Use, 168

**Braces (CRS). *See* Post braces (CRS)****Bracing bolt**

- Description, 10
- Uses, 9-10, 65, 156

**Bracing detail, 34****Bracing frames**

- Bracing bolts and, 9
- Bridge reinforcement with, 154-156
- Converting single-story bridge, 91, 99-100
- Counterweights, 235
- Deck-type bridge assembled with, 138-139
- Deck-type bridge expedient assembled with, 140
- Description, 9
- DT bridge assembled with, 107
- Extra-widened bridge assembled with, 131, 133-134
- Panel crib piers, 210, 223, 227-228
- Railway bridge assembled with, 144-145, 147-148
- Railway bridge launched with, 151
- Single girder launched with, 245, 247
- Single-story bridge assembled with, 71-73, 83
- Storage and transport, 278
- TD bridge assembled with, 98
- Two-lane bridge assembled with, 122
- Use (general), 2, 9

**Bridge, floating, 3****Bridge bearing plate (CRS), 180****Bridge length. *See* Length of bridge****Bridge location, 31****Bridge markers. *See* Markers****Bridge parts. *See* Parts****Bridge-seat rockers (CRS), 173, 181****Bridge-set components, 19, 39****Bridge site, reconnaissance of. *See* Site reconnaissance****Bridge site, selection of. *See* Site selection****Bridges on barges**

- Advantages and disadvantages, 261-262
- Anchorage, 273-275
- Barge selection, 265-266
- Construction, special, 270-273
- Design and capacities, 258-260
- Floating piers (supporting), 257

**Bridges on barges — continued**

- Maintenance detail, 275-276
- Rafts, 276
- Site layout, 265
- Site reconnaissance, 264
- Site selection, 263-265
- Superstructure, 259-260
- Superstructure parts, 263
- Work parties, 265, 275

**Bridges on piers.** *See* Broken-span bridges; Cantilever bridges; Continuous-span bridges

**Broken-span bridges**

- Advantages, 190
- Anchoring, 201
- Description, 190
- Intermediate supports of, 190

**Button stringers**, 10, 130. *See also* Stringers

**Cable reinforcement set**

- Classification, 160
- Components, 167-170, 173-175
- Demolition, 294-295
- Description, 159
- Dismantling, 186-187
- Installation, 159, 177-185
- Lubrication, 187-188
- Maintenance, 187-188
- Shipment, 189
- Tensioning, 184-185
- Transportation, 160
- Troubleshooting, 188
- Use in special environments, 187

**Cable-connection beam (CRS)**

- Cable and, 182-184
- Description, 169
- Installation, 180-181, 184
- Removal, 187
- Uses, 169-170, 173

**Cable-reel shaft (CRS)**

- Description, 169
- Use, 169, 177

**Cable-tension gage (CRS)**

- Description, 184
- Location, 159, 184
- Use, 184-185

**Cable tensioning (CRS)**, 159, 184-186

**Cable-tensioning assembly (CRS)**

- Description, 159
- Parts replacement, 188

**Cables (CRS)**

- Description, 159-160, 168
- Installation, 182-184
- Number of, 159
- Placement of, 179
- Retrieval, 186-187
- Storage and placement, 169
- Tensioning, 159, 184-186

**Cantilever bridges**, 206-209

**Capsill (improvised)**, 228

**Carrying bar**, 16

**Carrying tongs**, 16-17

**Causeways.** *See* Expedient structures

**Caution crossings**, 56, 112

**Chess**

- Bridges on barges, 259
- Broken-span bridge assembled with, 191
- Deck-type bridge assembled with, 140
- Description, 2, 10
- DT bridge bay assembled with, 107
- Expedient use of, 286
- Extra-widened bridge assembled with, 130, 134-135
- Extra-widened bridge bay assembled with, 133
- Extra-widened bridge launched with 132, 134
- Junction, 191, 215, 259
- Number per bay of, 10
- Railway bridge assembled with, 145
- Ramp-end support, 52-53
- Reinforced assemblies (over class 70), 91, 99
- Single girder launched with, 256
- Single-story bridge bay assembled with, 72, 83
- Single-story bridge launched with, 87
- Single-story bridge ramp, 88

**Chord(s)**

- Description, 6
- Reinforcing damaged, 283
- Welding damaged, 283-284
- Supplementary, 155, 283

**Chords bolts(s)**

- Converting DS to DD bridge, 99-100
- Description, 10
- Railway bridge assembled with, 148

**Chord clamps**, 216-217, 223-224

**Chord jack.** *See* Jack(s)

**Chord plate (CRS)**, 168

**Class(ification)**

- Broken-span bridge, 193
- Continuous-span bridge on pier, 199-201
- CRS and TS bridge, 159-160
- Damaged bridge after reinforcement, 281-283
- Deck-type bridges, 138
- Existing, 56
- Extra-widened bridge, 128
- Increased by added stories, 91
- NATO signs showing, 112
- Railway bridge, 145
- Reinforced bridge, 155-156
- Two-lane bridge, 114

**Clearance gages**, 144

**Clearances, vertical.** *See* Vertical clearances

**Connecting posts**, 259-260, 263, 270, 272

**Connecting spans.** *See* Span(s)

**Construction rollers**, 51, 57-58, 65

**Continuous-span bridges**

- Advantages, 198
- Assembly, 198-201
- Jacking, 204
- Launching, 203-205
- Maintenance, 204
- Pier reaction, 201

**Conversion set No. 3, panel crib pier M2**

- Bridges on barges, 267
- Broken-span bridge assembled with, 190-191
- Parts, 19, 215-219
- Transport of, 19
- Uses (general), 19, 215, 222

**Cooper's E-45 loading**, 145

**Counterbalance.** *See* Counterweight(s)

**Counterweight(s)**

- Counterbalance and, 234
- DD bridge launched with, 94
- End-on assembly and, 239, 241
- Fixed and movable (rolling), 235
- Launching nose and, 236-239
- Launching single girder with, 245, 247, 249
- Launching tail and, 238
- Launching without rollers, 241

- Counterweight(s) — *continued***
  - Restricted sites and, 235-238
  - Single-story bridge launched with, 85
  - Special spans launched with, 263
- Cranes**
  - Bridges on barges, 263, 270
  - Emplacing deck-type bridge girders, 141-142
  - Emplacing railway bridge girders, 152
  - End-on assembly with, 239
  - Panel crib pier assembled with, 231
  - Single girder launched with, 251-252, 245-246
  - Triple-story bridge assembled with, 102, 107, 110
  - Unloading bay loads with, 29
- Crib base, 227**
- Crib bearing, 218, 224**
- Crib capsill**
  - Chord clamp and, 215-217
  - Crib rocker base and, 224
  - Description, 218
  - Improvised, 225
  - Use, 218
- Cribbing. *See also* Grillage**
  - Bank-slope differences and, 145
  - Broken-span bridge conversion and, 190-191
  - End-transom support, 54
  - Grillage used as, 39
  - Jacking down, 87-89, 254
  - Pier, 269
  - Ponton, 241-243
  - Ramp midspan support, 52
- Crib loading. *See* Barges, loading methods**
- Cribs on barges, 267**
- Cross bracing**
  - Deck-type bridge expedient assembly and, 140
  - Railway bridge expedient assembly and, 151
- Crossing restrictions, 56, 112**
- Culverts, 184**
- DA Form 2258 (Depreservation Guide for Vehicles and Equipment), 189**
- Damaged bridges**
  - Assessment of damage, 279
  - Class after reinforcement, 281-283
  - Evaluation of damage, 281
  - Reinforcement, 283
  - Residual strength of damaged panel members, 279
- Shear and moment distribution, 279-280
- Welding, 283-284
- Decking**
  - Barge, 259
  - Deck-type bridge, 138, 256
  - Description, 2
  - Detail, 34
  - Expedient construction, 286, 290
  - Laminated, 139
  - Layered, 139-140
- Deck-type bridge(s)**
  - Advantages and disadvantages, 138
  - Assembly methods (expedient), 140
  - Assembly methods (recommended), 138-140
  - Class, 138
  - Design (expedient), 138
  - Design (recommended), 142
  - Launching, 141-142
- Demolition**
  - Bridge, 292-293
  - Cable set, 294-295
  - Methods, 292
  - Order of, 292
  - Stacked-equipment, 294
- Destruction of bridge, parts, and equipment. *See* Demolition**
- Details of work(ing) parties. *See* Work parties**
- Diked canals, 241**
- Dismantling**
  - Bridge with cable set, 186-187
  - Standard bridge, 284
- Distributing beam (rocker-bearing)**
  - Continuous-span bridge on pier, 199-201
  - Deck-type bridge assembly, 140
  - Railway bridge assembly expedient, 151
  - Two-lane bridge launched with, 123
- Double-action hydraulic cylinder (CRS)**
  - Cable-tensioning assembly and, 159, 174
  - Description, 175
  - Disassembly, 188
  - Installation, 184
  - Operation, 184-185
  - Retained on pull rod, 173
  - Uses, 170-174
- Double-story bridge**
  - Assembly methods, 94
  - Converting DS to, 99-100
  - Double-truss, 94-95
  - Extra-widened bridge assembly and launching, 135
  - Jacking down, 99
  - Launching, 94, 98-99
  - Launching-nose composition, 97
  - Reinforcing, 99
  - Triple-truss, 97-98
- Draw spans. *See* Span(s)**
- End posts**
  - Broken-span bridge span launched with, 196
  - Counterweight tail and, 235, 238
  - Deck-type bridge assembled with, 140
  - Description, 2, 11
  - Dismantling, 284
  - Double-story bridge launched with, 98
  - End-on assembly with, 241
  - Extra-widened bridge assembled with, 130, 133-135
  - Jacking, 12
  - Landing bays and, 270
  - Launching without rollers and, 241
  - Location, 2
  - Male and female, 11
  - Pier prepared with, 269
  - Railway bridge assembled with, 146, 148
  - Single girder launched with, 247, 250
  - Single-story assembly with, 72, 83
  - Single-story conversion and, 91-92
  - Single-story launching with, 87, 247, 250
  - Storage and transport, 278
  - Support, 39
  - Use (general), 11
- End-on assembly, 239, 241**
- Engineer equipment park. *See* Equipment park**
- Equipment, panel-bridge**
  - Advantages and disadvantages (railway bridging), 144
  - Expedient structures, 3
  - Expedient uses, 286, 289-291
  - Special structures, 3
  - Uses (normal), 94

- Equipment park**, 31-32
- Erection platform**, 94
- ETO (European theater of operations)**, 142, 151
- Expedient structures**
  - Causeways, 290-291
  - Decking, 286
  - Gantries, 3
  - Loading hoppers, 3
  - Panel box anchors, 291
  - Towers, 3, 210, 291
- Extra-wide vehicles**, 138, 286
- Extra-widened Bailey bridge M3**
  - Class, 128
  - Description, 128
  - Double-story bridge assembly and launching, 135
  - Grillage, 136
  - Origin, 2, 128
  - Parts, 130-131
  - Ramp supports, 136
  - Single-story bridge assembly and launching, 132-135
  - Special parts, 130-131
  - Triple-story bridge assembly and launching, 136
- Field design procedure**, 36-37, 45-46, 48-55
- Fixed piers**. *See* Piers
- Floating bay(s)**, 269-270
- Floating bridge**. *See* Bridge, floating
- Floating pier(s)**. *See* Pier(s), floating
- Footwalk(s)**
  - Bearer, 13-14
  - Description, 2, 13
  - Extra-widened bridge launched with, 132
  - Post, 14, 73
  - Single-story bridge, 73, 91-92
  - Working platform, 94
- Framed bents**, 190
- Gap**
  - Measurement, 36
  - Width, 31, 109
- GGP-GREASE, General Purpose**, 189
- Gantries**. *See* Expedient structures
- Gin poles**
  - DD bridge assembled with, 94
  - Single girder launched with, 245, 247, 250-252, 256
  - Triple-story bridge assembled with, 94
- Girders**, 2
- Grillage**
  - Bearing plates and, 39
  - Description, 39, 45
  - Extra-widened bridge assembled with, 136
  - Final bridge length and, 46-47
  - Loading, 266-268
  - Nonstandard, 45
  - Panel crib pier set on, 210
  - Railway bridge assembled with, 146
  - Reinforced bridge, 91-92, 155-156
  - Roller clearance and, 37, 44-45
  - Roller layout and, 58
  - Selecting, 31, 36, 45
  - Single to two-lane bridge conversion, 124-126
  - Soil character and, 45
- Guides**. *See* Traffic guides; Approach guides
- Gunwale loading**, 266-268
- Guy lines**, 275
- Harmonious vibration**, 199
- Headless panel pin**, 130, 134-135
- High line**
  - Railway bridge launching expedient, 152
  - Single girder launched with, 245, 247, 254
  - Single-story deck-type bridge launched with, 141
- Hydraulic power unit assembly (CRS)**
  - Cable-tensioning assembly and, 159, 174
  - Description, 173-175
  - Disassembly of, 188
  - Operation, 184-185
  - Parts replacement, 188
  - Powered by, 159, 175, 188
  - Types, 159
- Independent spans**. *See* Span(s)
- I-beams**, 211, 254, 259, 268, 291
- Installation steps (M2)**, 35
- Intermediate piers**. *See* Piers.
- Inverted launching nose**. *See* Launching nose
- Jack(s)**
  - Chord, 18
  - Deck-type bridge assembly expedient, 142
  - Description, 16
  - DT first bay assembled with, 107
  - Flotation launching with, 242
  - Number needed, 36, 51, 55
  - Pitch of teeth, 16, 87
- Positioning**, 51
- Shoe**, 16
- Single to two-lane bridge conversion**, 124-125
- Single-story bridge conversion**, 91-92
- Single-story bridge launching**, 86-88
- TD bridge launching**, 109
- Triple-story bridge**, 110
- Two-lane bridge assembled with**, 123
- Jacking**
  - Broken-span bridge on pier, 197-198, 204
  - CRS installation and removal, 180-181, 187
  - Damaged bridge, 283
  - Deck-type bridge assembly, 142
  - Dismantling bridge, 284
  - Double-story bridge assembly, 99
  - Double-story deck-type bridge launching, 141
  - Flotation launching, 242-243
  - Flotation-bay launching, 269-270
  - Landing-bay launching, 269
  - Launching platform, 239
  - Launching without rollers, 241
  - Panel crib pier, 231-233
  - Precautions, 88, 99
  - Single-girder launching, 250, 254-255
  - Single-story bridge assembly, 88
  - Triple-story bridge assembly, 109-110
  - Two-lane bridge assembly, 20
- Junction chess**. *See* Chess
- Junction link(s)**
  - Description, 216
  - Panel crib seating, 211, 215
- Junction-link bearings**
  - Crib rocker base, 224
  - Description, 216
  - Panel crib pier assembled with, 216
  - Panel crib seating, 211
- Landing bay(s)**, 269-270
- Landing-bay piers**, 210
- Lateral movement prevention**
  - Bridges on barges, 275
  - Broken-span bridges, 198-199, 204
  - Continuous-span bridges, 201
  - Double-story bridge assembly, 98
  - Two-lane bridge over crib pier, 223
- Longitudinal movement prevention**, 201, 275

**Launching**

- Broken-span bridge, 194-197
- By single girder, 245, 247, 250-252, 254-256
- Continuous-span bridge, 199, 203-204
- Counterweights and, 235-238
- Deck-type bridge, 141-143
- Double-story bridge, 98-99
- End-on assembly, 239-241
- Extra-widened bridge, 132-136
- Floating-bay, 269
- Flotation, 241
- Inverted launching nose, 239
- Landing-bay, 269
- Panel bridge, 49, 232
- Railway bridge, 151
- Single-story bridge, 86-87
- Special methods, 235-239, 241-243
- Standard, 235
- Swinging, 241
- Triple-story bridge, 102, 107-111
- Without rollers, 241

**Launching nose**

- Counterweight and, 236-239
- Deck-type bridge, 141
- Description, 49
- Designing, 55
- Dismantling, 284
- Double-story bridge, 97
- Inverted, 239
- Launching (normal) with, 49
- One-lane bridge, 64
- Reinforcing bridge with, 155
- Single-story bridge, 65
- Single girder launched with, 245, 247, 250
- Triple-story bridge, 103
- Two-lane bridge, 115, 124

**Launching-nose link MkII**

- Description, 18
- Extra-widened bridge launched with, 132
- Positioning, 49-51
- Single girder launched with, 250
- Two-lane bridge assembled with, 122
- Uses (general), 18, 49

**Launching pier, temporary.** *See also* Underslung bottom story

- Rocking rollers used with, 109
- TD bridge launched with, 109-110
- TT bridge launched with, 107

**Launching platforms.** *See* Platforms, launching

**Launching-tail assembly,** 235, 238

**Launching weight,** 123

**Layout.** *See* Site Layout

**Length of bridge**

- Computing, 37-39, 45-47
- Grillage type and, 45
- Reconnaissance report and, 31
- Roller clearance and, 45
- Truss type and, 45

**Lift spans.** *See* Span(s)

**Load distribution**

- Barges, 259, 266
- Causeway, 290
- Deck-type bridge, 138
- End-on assembly, 241
- Panel crib pier, 211
- Soft soil and, 2

**Loading hoppers.** *See* Expedient structures

**Location of bridge.** *See* Bridge location

**Maximum allowable slope (of bank).** *See* Slope

**Markers,** 112

**Mission-oriented protection posture (MOPP),** 34

**Mobile bridges,** 3

**MOPP.** *See* Mission-oriented protection posture

**Movement, lateral.** *See* Lateral movement prevention

**NATO bridge and vehicle classification signs,** 112

**Night driving,** 34, 112

**Overhead bracing**

- Expedient, 109
- Reinforced bridge, 155
- Triple-story bridge, 103

**Overhead-bracing support**

- Description, 14
- Extra-widened bridge assembled with, 136
- Supplementary chords and, 155
- Triple-story bridge assembled with, 103
- Two-lane bridge assembled with, 123
- Use (general), 2

**Overhead clearance (stated on NATO signs),** 112

**Overhead sway-brace extension (M3),** 131, 136

**Panel box anchors.** *See* Expedient structures

**Panel bridge conversion set No. 3.** *See* Conversion No. 3, panel crib pier

**Panel bridge, Bailey M2.** *See* Bailey bridge M2

**Panel chords.** *See* Chords

**Panel crib piers.** *See* Piers, panel crib

**Panel detail,** 33

**Panel pin.** *See also* Headless panel pin; Short panel pin Description, 6-7

- Double-story bridge assembled with, 95, 97
- DT bridge bay assembled with, 107
- Extra-widened bridge assembled with, 133-134
- Panel crib pier assembled with, 216, 218, 225
- Single girder launched with, 247
- Single-story bridge bay assembled with, 71-72, 83
- Single-story bridge converted with, 91-92, 98-99
- Single-story bridge launched with, 86
- Single-story bridge launching nose assembled with, 65
- Storage and transport, 278

**Panel lever,** 16, 91

**Panels**

- Carrying, 6, 16
- Description, 2, 6
- Extra-widened TS bridge assembled with, 133-135
- Panel crib pier, 210-211, 216
- Reinforcing damaged, 283
- Single-story bridge assembled with, 71-73, 83
- Single-story bridge converted with, 91-93
- Single-story bridge launching nose assembled with, 65
- Storage and transport of, 278

**Parts**

- Basic bridge set, 6
- CRS, 167-170, 173-175
- Destruction of, 292-294
- Expedient use of damaged, 291
- Extra-widened bridge, 130-131
- Maintenance, 278
- Panel crib piers and towers (special), 215-219
- Railway-bridge, 148-150
- Reinforced-bridge, 155
- Replacement (CRS), 188
- Spare, 279
- Storage and transport, 278

**Pickets (steel),** 65

**Piers**

- Alignment and spacing of, 191
- Barge bridges and, 210
- Broken-span bridges on, 190-191
- Computation of load on, 194, 202-203
- Continuous-span bridges on, 199
- Cribbing under, 201, 204
- Fixed, 109
- Intermediate, 190-191, 210
- TD bridge launched onto, 109

**Piers, floating**

- Bays supported by, 258
- Bridges on barges and, 257
- Preparation of, 268-269
- TD bridge launched with, 109
- Types of, 257

**Piers, panel crib**

- Assembly (expedient) of, 225-228
- Assembly (standard) of, 222-224
- Bills of material for, 222
- Bridge seating on, 211
- Broken-span bridges supported by, 190
- Components of, 210
- Crib characteristics of, 210-211
- Launching bridge onto, 232
- Launching platforms and, 239
- Load and capacity of, 219
- Set, 263
- Special parts, 215-219
- Triple-story bridge on, 109-110
- Truss standard assembly of, 222-224
- Types of, 210-211
- Uses, 210

**Pier reaction.** *See* Broken-span bridge

**Pile bents,** 191

**Pin extractor,** 18

**Pitch of teeth.** *See* Jack(s)

**Placement control lines,** 58-59

**Plain rollers.** *See also* Constuction rollers; Roller

- layout; Rollers
- Counterweight secured by, 84-85, 234-235
- Description, 15, 57
- Dismantling of, 284
- DS bridge underslung story and, 110
- Extra-widened bridge assembled with, 132

- Layout (location) (M2), 51, 57
- Layout (location) (M3), 132-135
- Load allowable on, 15
- Lubrication of, 278
- Number needed of, 51
- Single girder launched with, 245, 247
- Templates, 18, 57
- Two-lane bridge assembled with, 122

**Plain stringers.** *See* Stringers

**Platforms, launching,** 235, 239

**Point of contraflexure,** 196

**Pontoons.** *See also* Rafts

- Causeway, 291
- Flotation launching on, 141-143
- Single girder launched with, 252
- TD bridge launched with, 109

**Post-connection fixture (CRS),** 167-169, 177, 183, 187

**Post braces (CRS),** 168, 178, 183-184, 187

**Prepared abutments.** *See* Abutments

**Pull-rod assembly (CRS),** 173

**Pull-rod chain (CRS),** 173, 183

**Pull rods (CRS),** 170, 173, 182-183, 186

**Rafts.** *See also* Pontons

- Bridges on barges and, 276
- Causeways and, 291
- Deck-type bridge girder flotation on, 141

**Rails,** 141, 146

**Railway bridges**

- Advantages and disadvantages, 144
- Assembly method (deck-type), 148-150
- Assembly method (through-type), 145-147
- Class of, 145
- Description, 144-145
- Expedients for, 151-152
- Launching of, 151

**Railway ties,** 144-145, 148-149

**Rakers**

- Converting single-story bridge with, 92
- Description (M2), 8-9
- Description (M3), 130
- Extra-widened bridge assembled with, 133, 135
- Inverted launching nose and, 239
- Panel crib pier bracing with, 210, 229
- Railway bridge assembled with, 150
- Single girder launched with, 256

- Single-story bridge assembled with, 65, 71-72, 83
- Storage and transport of, 278
- TD bridge assembled with, 98
- Two-lane bridge assembled with, 133, 135
- Underslung story launched with, 111
- Use (general), 2, 9

**Ramp pedestal**

- Description (M2), 12, 53
- Description (M3), 131
- Uses (M2), 53, 290
- Uses (M3), 131

**Ramps**

- Button, 12
- Description, 2, 12
- Dismantling of, 284
- Plain, 12
- Railway-bridge, 146
- Single-story bridge, 88
- Slope of, 2, 53, 55, 58
- Support for (M2), 52, 55
- Support for (M3), 136
- Through-type bridge, 256
- Two-lane bridge clearance and, 115
- Use (general), 2
- Use as expedient bridge pier cap, 226
- Weight on, 52

**Reconnaissance officer (bridge site).** *See* Site reconnaissance

**Reconnaissance report.** *See* Site reconnaissance

**Reinforcing**

- Damaged panel and chords, 283
- Double-story bridges, 99
- Single-story bridges, 91
- Two-lane bridges, 123

**Restricted sites,** 235

**Retractable bridges,** 3

**Ribbands**

- Description (M2), 10
- Description (M3), 130
- Double-story bridge launched with, 98-99
- Extra-widened bridge assembled with, 130, 135
- Single girder launched with, 256
- Uses (general), 10, 186

**Ribbon bolts**

- Deck-type bridge decking with, 129

**Ribband bolts — continued**

- Description, 10
- Expedient panel crib pier assembled with, 227
- Use (M2), 10
- Use (M3), 30

**Risk crossing, 56, 112****Risk loads, 56****Roadway width**

- Deck-type bridge, 138
- Stated on NATO signs, 112

**Rocker bearings, 223****Rocking rollers. See also** Grillage; Plain rollers;

- Rocking-roller templates; Roller
- Bridge launched over crib pier with, 232
- Cable reinforcement and, 181, 187
- Continuous-span bridge on pier launched with, 199-201
- Counterweight secured with, 85-86
- Counterweight tail and, 235, 238
- DD bridge assembled with, 94
- Description, 15
- Dismantling, 284
- Floating bridge launched with, 69-70
- Flotation launching with, 240-241
- Landing bay launched with, 269
- Launching platforms on, 239
- Load allowable on, 15
- M2 bridge launched with, 15, 39, 51
- Number needed of, 51
- Safety setback and, 37, 57
- Single girder launched on, 244, 247, 250
- Single-story bridge launched on, 65, 85-87
- Spacing of (M3), 132
- TT bridge launched on, 107-108
- Two-lane bridge assembled and launched on, 122-123

**Rockers**

- Bridge-on-pier, 199-203
- Panel crib pier, 211, 224

**Rocking-roller templates**

- Cable reinforcement with, 181
- Description, 18, 57
- Extra-widened bridge assembled on, 132
- Uses (general), 39, 57

**Rod-to-cable coupling (CRS), 168, 173, 182-183, 186****Roller**

- Clearance, 37-38, 45-46
- Heights, 58, 98
- Layout, 35, 57-59, 245, 247

**Rollers. See** Plain rollers; Rocking rollers**Safety setback, 37, 57****Sag, excessive**

- Converting of DS to DD bridge and, 99-100
- DD bridge assembly and, 94-95

**SALE (single-axle load equivalents), 206-207****Shear**

- Bridge damage effect on, 281
- Maximum moment and, 280
- Moment distribution and, 279-280

**Short panel pin, 7****Single-axle load equivalent(s). See** SALE**Single girders. See** Launching**Single-story bridges**

- Assembly methods, 71-73
- Converting single- to double-truss, 91
- Converting double- to triple-truss, 92
- Extra-widened, 132-135
- Jacking of, 87-88
- Launching of, 65, 86-87
- Launching-nose composition for, 64
- Ramps on, 88
- Reinforcing, 91
- Assembly of triple-truss, 83

**Site layout**

- Bridges on barges and, 265
- Clearing a, 32
- CRS assemblies and parts and, 177, 183
- Location of, 31
- Stacks arranged on, 32
- Width of, 32

**Site location. See** Site layout**Site preparation**

- Bridges on barges and, 265
- Reconnaissance report and, 31
- Steps, 35
- Time needed for, 34

**Site reconnaissance**

- Bridges on barges and, 264
- Officer, 31

**Preliminary data for, 31****Report, 31-32****Site selection, 263-264. See also** Assembly site;**Restricted sites****Skidding beams, 241, 250, 254-255****Slope**

- Bank, 45
- Bridge, 31
- Ramp, 2

**Snubbing tackle, 245, 247, 250-252****Soil-bearing capacity (SBC). See** Soil character**Soil character**

- Grillage type and, 39, 45
- Ramp end and, 52
- Safe bearing pressure and, 45
- Soil-bearing capacity (SBC) and, 45, 52-53

**Span junction posts**

- Bridges on barges assembled with, 259, 261, 263, 272-273
- Broken-span bridges assembled with, 211-215
- Broken-span seatings and, 191, 223
- Broken-span span launched with, 195-196

**Span junction posts (CRS)**

- Cable-connection beams and, 181, 184
- Description, 175
- Installation, 179, 184
- Installation of CRS with, 159
- Removal of, 187
- Use (general), 175

**Span(s)**

- Connecting, 270
- Draw, 271-273, 275
- Independent, 190
- Lift, 271-273, 275
- Without end posts, 289

**Spare parts. See** Parts**Special launching methods. See** Launching methods**Steel pickets. See** Pickets (steel)**Stringers**

- Bridges on barges assembled with, 259, 273
- Broken-span bridges assembled with, 191
- Deck-type bridge assembled with, 140
- Description, 10
- Extra-widened TS bridge bay assembled with, 133-134

**Stringers — continued**

- Launching without rollers and use of, 241
- Number per bay of, 10
- Plain, 10, 130
- Railway bridge assembled with, 145
- Single girder launched with, 255-256
- Single-story bridge assembled with, 133-134

**Supplementary chords.** *See* Chords**Sway braces**

- Description (M2), 8
- Description (M3), 131
- Extra-widened bridge assembled with, 136
- Extra-widened bridge bay assembled with, 210, 223, 228-229
- Inverted launching nose and, 239
- Panel crib pier assembled with, 210, 223, 228-229
- Railway bridge assembled with, 148
- Single girder launched with, 256
- Single-story bridge assembled with, 65
- Single-story bridge bay assembled with, 71-73, 83
- Storage and transport of, 278
- Tensioning, 8
- Triple-story bridge assembled with, 2, 103
- Two-lane bridge assembled with, 122
- Uses (general), 2, 8

**Sway-brace turnbuckle, 71-73****Tackle.** *See* Block and tackle**Templates.** *See* Plain rollers; Rocking-roller templates**Tie plates**

- Converting single-story bridge with, 92
- Description, 9
- Expedient panel crib pier assembled with, 227-228
- Extra-widened single-story bridge assembled with, 135
- Panel crib bracing with, 210, 223
- Railway bridge assembled with, 144-145, 148-149
- Reinforcing bridge with, 155
- Single girder launched with, 245-247
- Single-story bridge bay assembled with, 71, 83
- Storage and transport of, 278
- Triple-truss bridge assembled with, 2, 98
- Two-lane bridge assembled with, 122
- Uses (general), 9

**Ties.** *See* Railway ties**Timber blocking, 140****Timber cribbing, 39, 54**

- Across improvised capsills, 228
- Expedient use of, 289
- On barges, 259
- Panel crib piers and, 216

**Timber decking (expedient)**

- Bridge on crib pier with, 211, 226
- Deck-type bridge assembled with, 139-140, 256
- Railway bridge assembled with, 146, 151
- Use (general), 286

**Timber grillage, 39, 45****Timber packing,**

- End-on assembly and, 239, 241
- Underslung story added with, 111

**Timber stringers**

- Broken-span bridge assembled with, 191
- Expedient decking, 286

**Timber trestles, 191, 284****Turnbuckles.** *See* Sway-brace turnbuckles**Toe of slope, 36-37****Towers.** *See* Expedient structures**Traffic**

- Guides, 112
- Restrictions, 112
- Vibration, 139

**Transom clamps**

- Converting single-story bridge with, 91
- Description (M2), 8
- Description (M3), 130
- DT bridge assembled with, 107
- Extra-widened bridge assembled with, 133-134
- Railway bridge assembled with, 145
- Single-story bridge assembled with, 71, 83
- Single-story bridge launching nose assembled with, 65

**Transom detail, 34****Transom roller, 15-16****Transoms**

- Carrying, 8, 18
- Converting single-story bridge with, 91-92
- Description (M2), 7-8, 57
- Description (M3), 130
- Double, 155-156
- Expedient panel crib pier cap, 226, 229
- Inverted launching nose and, 239

**Number per bay of (M2), 8, 83****Number per bay of (M3), 130****Panel crib pier bracing and, 210, 223****Placing, 8****Positioning (M2), 2****Positioning (M3), 133-134****Railway bridge assembled with, 145, 148-150****Single girder launched with, 256****Single-story bridge assembled with, 72-73, 83****Single-story bridge launched with, 87****Single-story bridge launching nose assembled with, 65****Spacing, 8****Spacing rocking rollers with, 57****Spans without end posts and, 289****Supporting ramps with, 52****Supports for, 54-55****Use (general), 2, 7****Triple-double bridge assembly, 97-98****Triple-single bridge assembly (M2), 83****Triple-single bridge assembly (M3), 133-135****Triple-story bridges****Assembly of, 102, 109-111****Assembly and launching (M2) of triple-truss, 107-109****Assembly and and launching (M3) of triple-truss, 136****Assembly of double-truss, 107****Extra-widened, 136****Jacking, 109****Launching, 107-109****Launching-nose composition and, 103****Overhead bracing on, 103****With underslung story, 109****Truck loads****Basic bridge set, 19****Crib pier, 19, 29****CRS, 160, 189****Movement of, 35****Truss bridge.** *See* Bailey bridge M2**Trusses****Class determination of, 39****Needed type of, 36****Panel crib pier, 22-23****Type of, 31****Turnaround area, 31-32, 35**

**Two-lane through-type bridge**

- Assembly of, 115, 122-123
- Assembly time of, 122
- Class of, 114
- Converting one-lane to, 124-125
- Description, 114
- Jacking of, 123
- Launching of, 123
- Limitations of, 114
- Parts and spares, 114
- Reinforcing, 123
- Roller layout, 122
- Use, 114
- Work parties, 122

**Underslung bottom story**

- Double-story bridge with, 110-111
- Triple-story bridge with, 109, 142
- Two-lane bridge reinforced with, 123

**Unloading party. See Work parties**

**Unprepared abutments. See Abutments**

**Vertical clearances, 109, 239**

**Vertical post assembly (CRS), 167, 177, 183, 187**

**Wear treads**

- Deck-type bridge layered-decking, 130
- Depth of, 58
- Installation of, 34-35
- Reinforcing decking with, 91, 99, 259

**Width of (the) gap. See Gap**

**Winch line**

- Railway bridge launched with, 151
- Two-lane bridge launched with, 123

**Work(ing) details. See Work parties**

**Work parties**

- Assembly of, 33-35
- Bridges-on-barges, 265, 275
- Launching with counterweight and, 236
- One-lane bridge assembly and, 32-33
- Single-girder launching and, 245
- Two-lane bridge assembly and, 122
- Unloading and, 32, 35

**Wrenches**

- Basic bridge set, 16
- CRS, 175