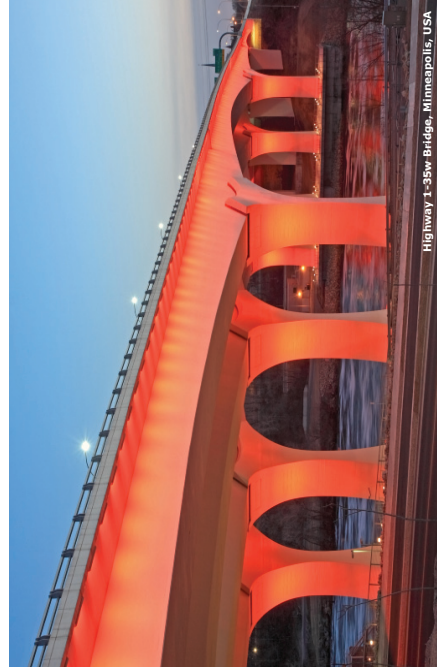


Deutz Bridge in Cologne



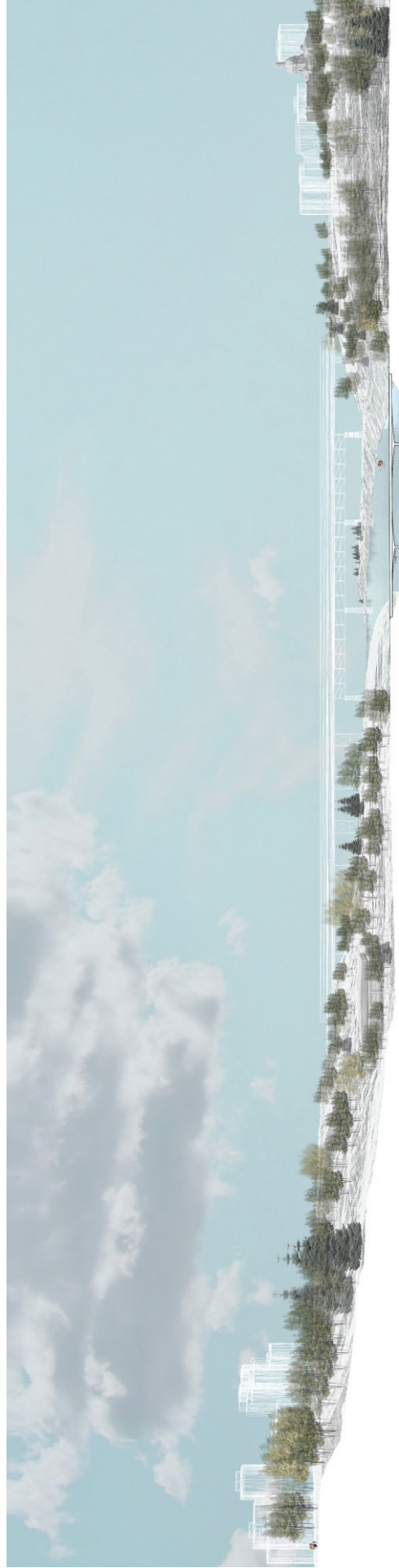
Kingston Bridge, Glasgow, Scotland



Highway 1-35w Bridge, Minneapolis, USA

GIRDER BRIDGE

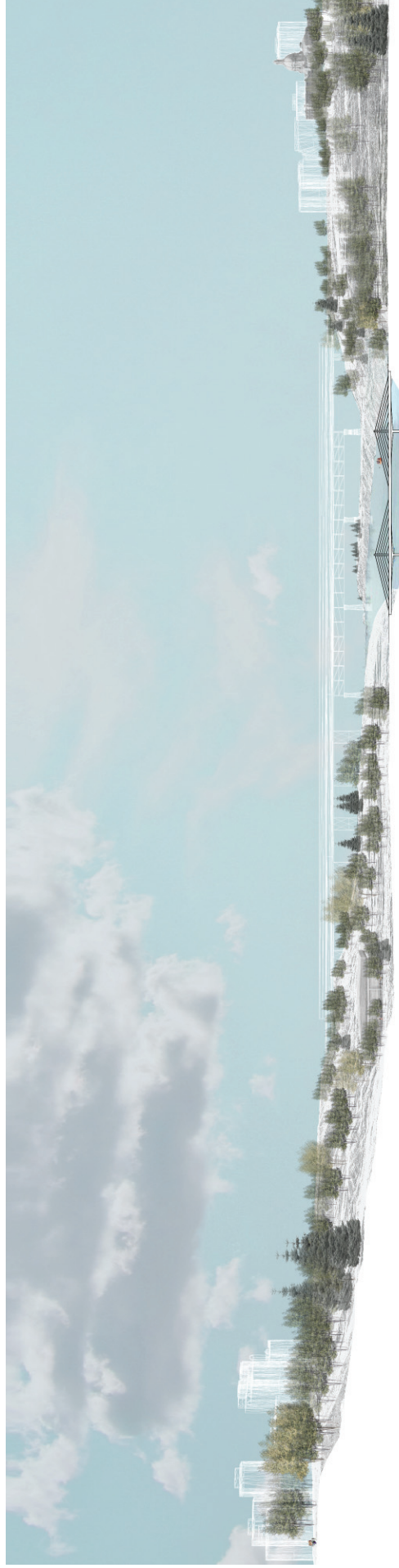
Gird•er [n] - A large beam made out of steel or concrete. A straight or slightly curved structure designed to act primarily in flexure (bending). Sometimes tensioned with internal cables.





EXTRADOSED BRIDGE

Ex•tra•dosed [n] - A girder bridge in which the tension cables are installed outside and above the main girder and deviated by short towers located at supports. A hybrid between girder and cable-stayed.

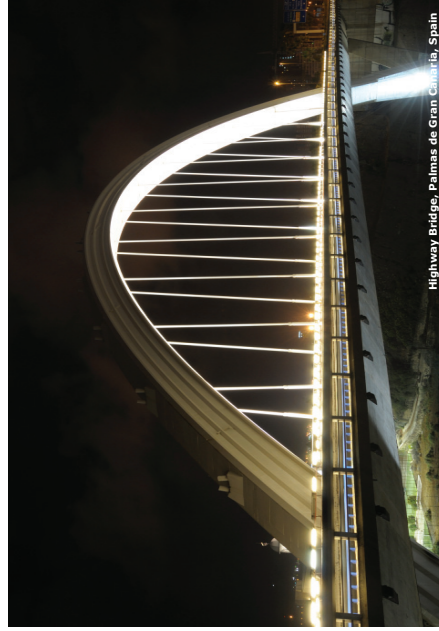


WALTERDALE BRIDGE REPLACEMENT

CONCEPT PLANNING STUDY | PHASE 1 SUMMARY REPORT | 2010.12.23

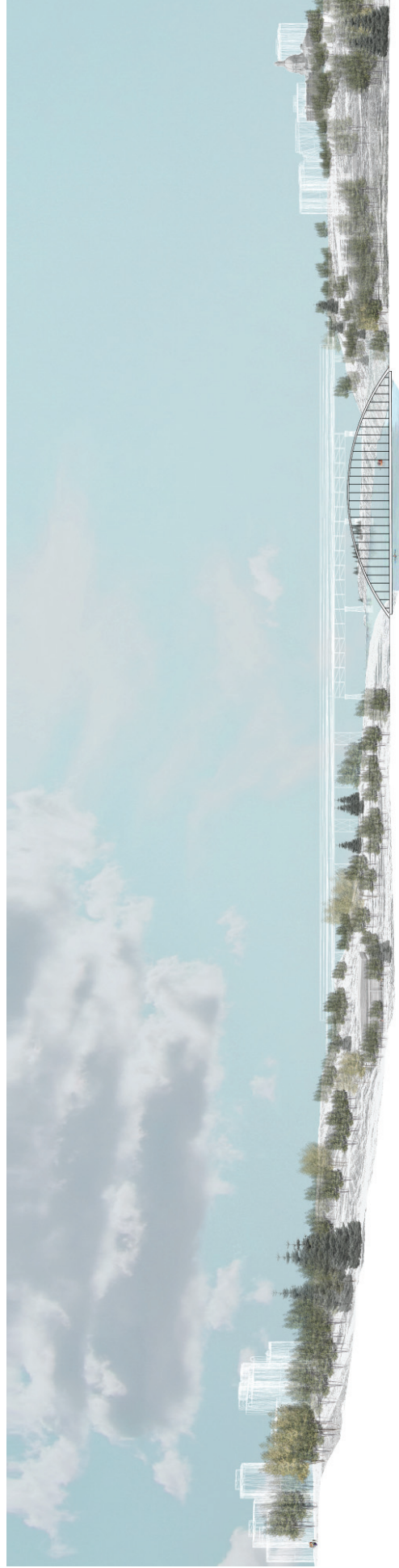


EXTRADOSED ALTERNATIVE SECTION IN VALLEY



ARCH BRIDGE

Arch [n] - A curved structure designed to act primarily in compression. Horizontal thrust reactions are resisted by a tension tie or embedment into the earth.



WALTERDALE BRIDGE REPLACEMENT

CONCEPT PLANNING STUDY | PHASE 1 SUMMARY REPORT | 2010.12.23



ARCH ALTERNATIVE SECTION IN VALLEY



Alamillo Bridge, Seville, Spain



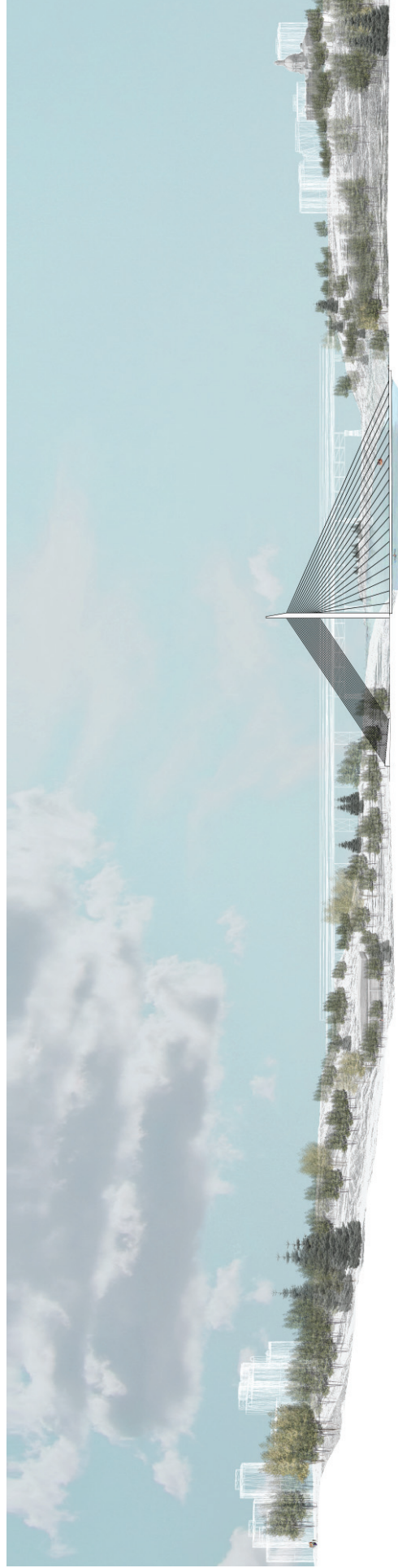
Lover's Bridge, DanShui, Taiwan



Erasmus Bridge, Rotterdam

CABLE-STAYED BRIDGE

Cable-stayed [n] - A slender girder system cantilevered both ways from a central tower and supported by inclined cables attached to the tower.



Walterdale Bridge Style Comparison Matrix

| | | Bridge Type | | | |
|--------------------------|--|--|--|---|---|
| CRITERIA | | GIRDER | EXTRADOSED | ARCH | CABLE STAYED |
| TECHNICAL CONSIDERATIONS | Profile in North Saskatchewan River Valley | <ul style="list-style-type: none"> Low profile; you wouldn't know you were on a bridge. | <ul style="list-style-type: none"> Slightly higher profile than girder; deck more slender. | <ul style="list-style-type: none"> Deck very slender; arch quite prominent. | <ul style="list-style-type: none"> Deck very slender; tower about 3 times higher than High Level Bridge. |
| | Impact on river | <ul style="list-style-type: none"> Two piers in river; removal of existing piers. | <ul style="list-style-type: none"> Two piers in river; removal of existing piers. | <ul style="list-style-type: none"> No piers in river; removal of existing piers. | <ul style="list-style-type: none"> No piers in river; removal of existing piers. |
| | Impact on south river bank | <ul style="list-style-type: none"> New abutment, removal of existing abutment. | | | <ul style="list-style-type: none"> New abutment and pylon on south bank. New large tie-down block. Remove existing abutment. |
| | Impact on north river bank | <ul style="list-style-type: none"> New abutment, removal of existing abutment. | | | |
| | Utilities integration | <ul style="list-style-type: none"> Utilities should fit between girders. | | <ul style="list-style-type: none"> Utilities may be carried in box between east walk and road barrier. | |
| | Constructability | <ul style="list-style-type: none"> Common bridge type. Space may be required to launch girders from bank. | <ul style="list-style-type: none"> Less common bridge type. Slightly more complex than girder. | <ul style="list-style-type: none"> Arch erection complex. Deck easy to erect. | <ul style="list-style-type: none"> Very tall tower. Deck easy to erect. |

| | | Bridge Type | | | |
|---------------|---|--|---|---|--|
| CRITERIA | | GIRDER | EXTRADOSED | ARCH | CABLE STAYED |
| ACCESSIBILITY | Pedestrian experience and safety | <ul style="list-style-type: none">Minimal separation between pedestrians and vehicles.Higher above water unless pedestrian walkway is a separate element. | <ul style="list-style-type: none">Enhanced buffer between roadway and pedestrians due to cable structure.Higher above water. | <ul style="list-style-type: none">Enhanced buffer between roadway and pedestrians due to cable structure.Lower to water. | <ul style="list-style-type: none">Enhanced buffer between roadway and pedestrians due to cable structure.Lower to water. |
| | Bicycle experience and safety | <ul style="list-style-type: none">Minimal separation between pedestrians and vehicles.Higher above water unless pedestrian walkway is a separate element. | <ul style="list-style-type: none">Enhanced buffer between roadway and bicycles due to cable structure.Higher above water. | <ul style="list-style-type: none">Enhanced buffer between roadway and bicycles due to cable structure.Lower to water. | <ul style="list-style-type: none">Enhanced buffer between roadway and bicycles due to cable structure.Lower to water. |
| | Access to Kinsmen Sports Centre | <ul style="list-style-type: none">Bridge type does not impact access. | | | |
| | Access to Rosedale Generating Station | <ul style="list-style-type: none">Bridge type does not impact vehicular access. | | | |
| | Access/ integration with north multi-use trail system | <ul style="list-style-type: none">Structural design allows higher elevation for trail and promenade (closer to existing elevation).Structure has potential to be split to reduce impact of bridge widths on trails below. | <ul style="list-style-type: none">Structural design allows higher elevation for trail and promenade (closer to existing elevation). | <ul style="list-style-type: none">Structural design requires lower trail and promenade. | |
| | Access/ integration with south multi-use trial system | <ul style="list-style-type: none">Bridge higher on south bank.Rail system can be generous and fully integrated. | | <ul style="list-style-type: none">Bridge lower to river and will require a technical solution to incorporate trail below bridge. | <ul style="list-style-type: none">Tower proximity to water's edge impacts trail.Difficult to incorporate promenade under bridge unless bridge deck is raised. |

| | | Bridge Type | | | |
|-------------|----------------|--|------------|------|--------------|
| CRITERIA | | GIRDER | EXTRADOSED | ARCH | CABLE STAYED |
| CONSTRAINTS | Legislative | Commentary to form part of final report. | | | |
| | Regulatory | Commentary to form part of final report. | | | |
| | Geotechnical | Commentary to form part of final report. | | | |
| | Archaeological | Commentary to form part of final report. | | | |
| | Environmental | Commentary to form part of final report. | | | |

| | | Bridge Type | | | |
|-------------------------------|--|---|---|---|--|
| CRITERIA | | GIRDER | EXTRADOSED | ARCH | CABLE STAYED |
| ADJACENT PROJECTS/INITIATIVES | Kinsmen Sports Centre | • Bridge design has no apparent impact. | | | |
| | Burial Grounds | • Bridge profile has little visual impact. | • Lower profile of towers has low visual impact. | • Height of arch has strong visual impact. May reduce visual presence of burial grounds. | • Height of tower and cable system has strong vertical presence. May reduce visual presence of burial grounds. |
| | Interpretive Display | • Bridge design has no apparent impact. • Road alignment may require a re-location of Interpretive Display. | | | |
| | West Rosedale Urban Design Plan | • Good opportunity to complement strong public realm design and enhanced relationship to water's edge. | | • Higher degree of visual presence as to potential to reduce importance of public realm. | |
| | Impact on repurposing of Rosedale Generating Station including Pumphouse 1 & 2 | • Low visual profile provides opportunity to open views to and from the site, and create a strong presence for the Power Station. | • Superstructure design potentially diminishes the presence of the Power Station and obscures views to and from the site. | | |
| | Impact on/relationship to Legislature Grounds | • Low visual profile provides opportunity to open views to site. | • Superstructure is below south lawn but obscures sustained views to Legislature. | • Superstructure is above south lawn of Legislature. • Obscures sustained view to Legislature. | |

| | | Bridge Type | | | |
|---------------|---|--|---|--|---|
| CRITERIA | | GIRDER | EXTRADOSED | ARCH | CABLE STAYED |
| OPPORTUNITIES | Watercraft use of river | <ul style="list-style-type: none">Piers in water may impact watercraft. | | <ul style="list-style-type: none">No piers in water will enhance use of river by watercraft. | |
| | Wildlife passage | <ul style="list-style-type: none">Bridge type choice has no impact. | | | |
| | Functional Signature Opportunity - point of pride | <ul style="list-style-type: none">Simple structural design creates opportunity for unique, innovative approach to signature focused on public realm and integration into valley. | <ul style="list-style-type: none">Stronger visual statement inherent with tower and cables.Some opportunity for enhanced public realm and integration into valley. | <ul style="list-style-type: none">Very strong visual impact of bridge type will be signature in and of itself.Public realm somewhat diminished in importance. | |
| COST | Capital cost | <ul style="list-style-type: none">Lowest. | <ul style="list-style-type: none">Medium. | <ul style="list-style-type: none">Highest. | <ul style="list-style-type: none">Medium. |
| | Operating & maintenance costs | Commentary to form part of final report. | | | |
| | Life cycle cost | Commentary to form part of final report. | | | |