1.

East Elevation

The Bronze Blade

Gwrys yn Kernow

The rugged, wild beauty of this rich yet fragile site calls for a robust and delicate response - a bridge that is elegant, efficient, exhilarating and rooted in this spectacular place.

The Bronze Blade is a beam bridge - the oldest and simplest of bridge structures. Contemporary technology enables us to take it to new levels of breath-taking slenderness. The material choice is inspired by the historical significance of the site's mineral resources; the 25 year old bronze handrails on site and Arthurian legend - the sword Excalibur. The bronze patination will enhance its appearance and durability – creating a visual link to the natural variations in the rock and lichens of the SSSI.

The exceptionally tall, slender, twin pillars supporting the bridge are inspired by the dramatic natural stone stack formations and mining chimneys found along the coast. They are striated in coloured, locally sourced, concretes that echo the seams of the surrounding geology.

Bronze Sword

Coastal Features: Typical Cornish Rock Stacks

On the Bridge towards the Island

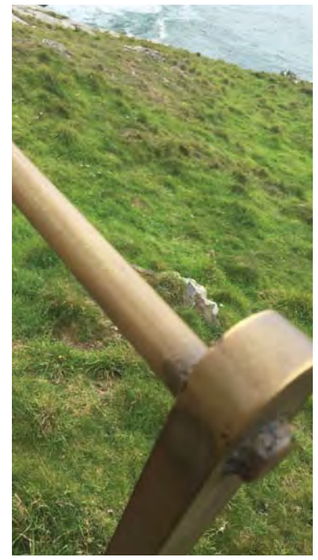
The Bridge from the Island

Tintagel Castle : Layered Stone Ruins

Cornish Heritage : Tin and Copper Mine Chimneys

2.

View Across to the Island from the Lower Courtyard



Tintagel Castle: Bronze handrail, polished by human hand

Site Plan

Slate beam bridge

Seams of Mudstone Quartz & Slate

Winter sunset

3.

Mainland landing detail view

Island landing detail plan

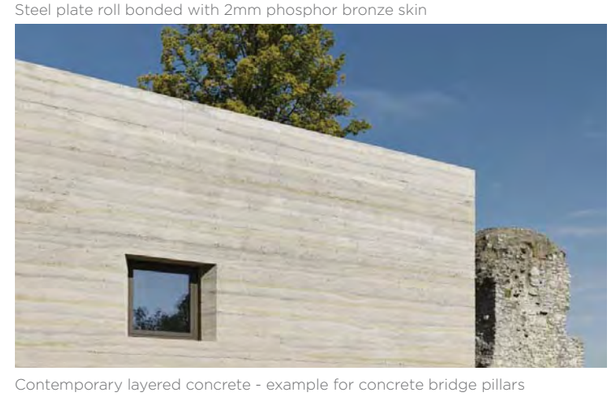
Mainland landing detail plan

Layered Slate and Riven slate surface

Rhizocarpon geographicum crustose lichen

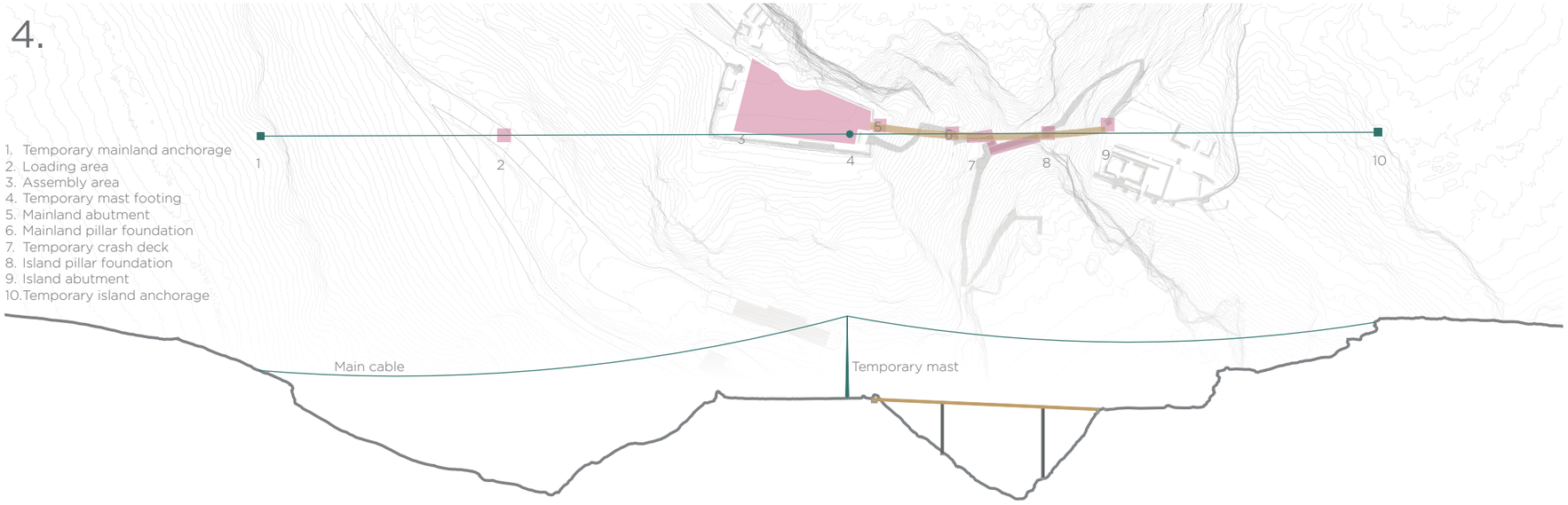
Patinated bronze references lichen texture

Steel plate roll bonded with 2mm phosphor bronze skin



Contemporary layered concrete - example for concrete bridge pillars

4.



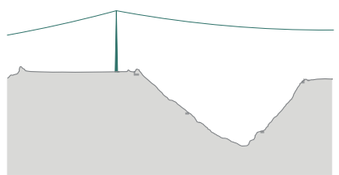
1. Temporary mainland anchorage
2. Loading area
3. Assembly area
4. Temporary mast footing
5. Mainland abutment
6. Mainland pillar foundation
7. Temporary crash deck
8. Island pillar foundation
9. Island abutment
10. Temporary island anchorage

Cable crane

Cable Cranes are an effective, low impact, way to transport material over difficult terrain. They are inherently versatile, typically consisting of some combination of – anchorages, masts, cables, and travelling bogeys.

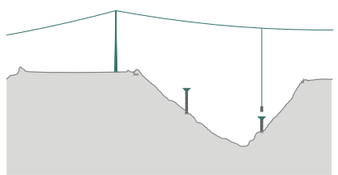
In this configuration, a main cable is supported by a single mast in the Lower Ward, and is anchored high up on the valley slopes on one side, and the island plateau on the other. A travelling bogey will winch up material from the loading area and then carry it along the main cable to the assembly area and the pier foundations.

Step 1



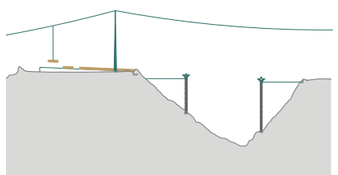
- Install cable crane anchorages and erect cable crane
- Excavate to foundation level
- Construct foundations at the abutments and pier base

Step 2



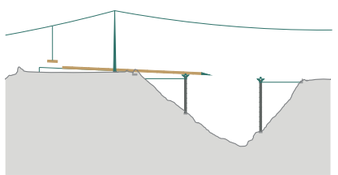
- Precast pier formwork transported to pier location
- Units stacked on top of each other and coupled together
- Reinforcement cages fixed and concrete cast in internal void in stages

Step 3



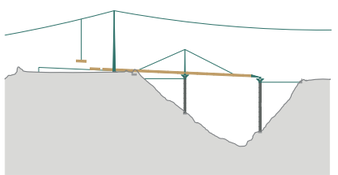
- Prefabricated deck segments transported to assembly area
- Segments laid out on rails and spliced together

Step 4



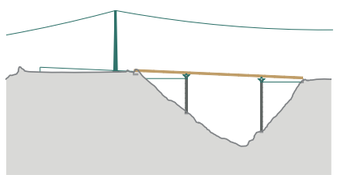
- Launching nose attached to deck
- Temporary rollers attached to piers
- Temporary works secure the piers to the cliff faces
- Hydraulic jacks launch the bridge deck over first span

Step 5



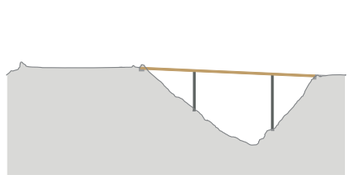
- Attach further deck segments
- Temporary king post erected to control end of deck cantilever
- Launch over main span

Step 6

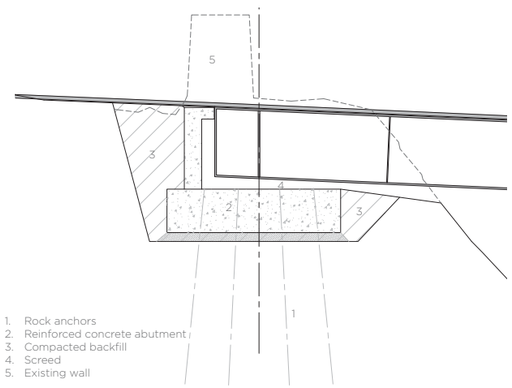


- Launch over third span

Step 7

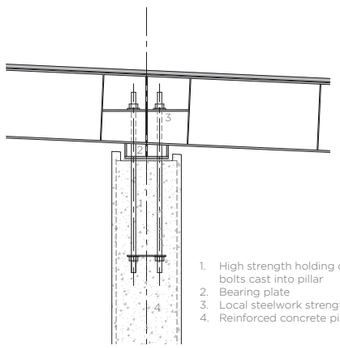


- Deck lowered onto permenant bearings
- Finishing works carried out



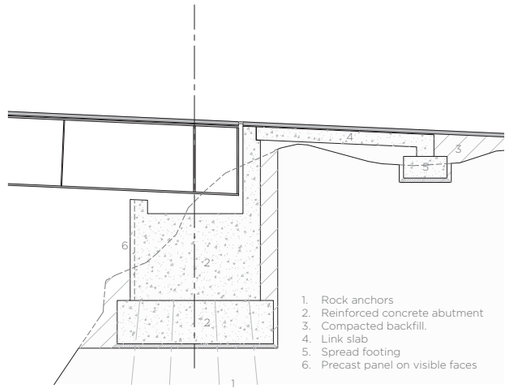
1. Rock anchors
2. Reinforced concrete abutment
3. Compacted backfill
4. Screed
5. Existing wall

Mainland landing - long section



1. High strength holding down bolts cast into pillar
2. Bearing plate
3. Local steelwork strengthening
4. Reinforced concrete pillar

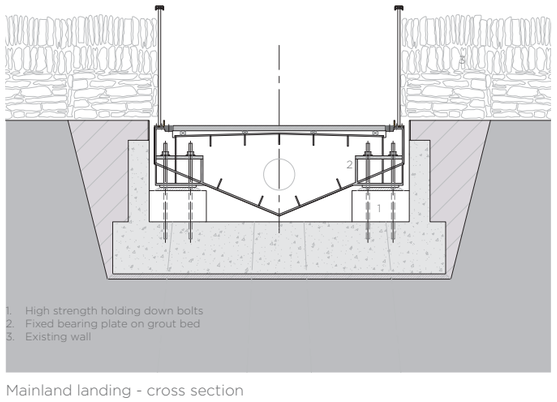
Concrete pillar - long section



1. Rock anchors
2. Reinforced concrete abutment
3. Compacted backfill.
4. Link slab
5. Spread footing
6. Precast panel on visible faces

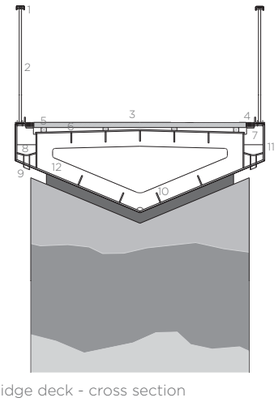
Island landing - long section

1. Phosphor bronze handrail
2. Phosphor bronze flats with 100mm gaps
3. Slate walking surface
4. Phosphor bronze drainage grille
5. Patinated phosphor bronze roll bonded to external face of structural steel plate
6. Internal diaphragms at regular centres



1. High strength holding down bolts
2. Fixed bearing plate on grout bed
3. Existing wall

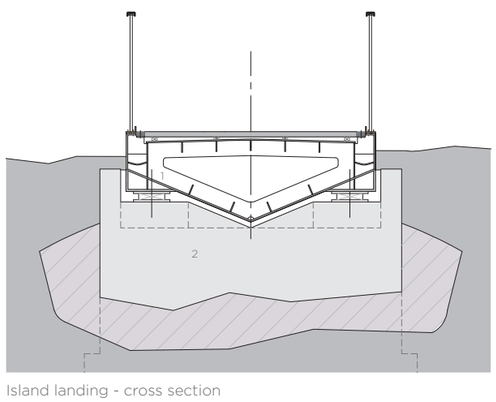
Mainland landing - cross section



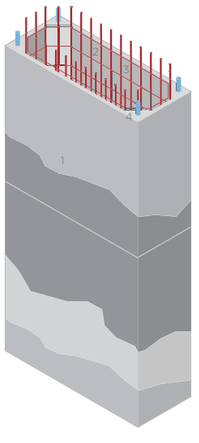
1. Phosphor bronze handrail
2. Phosphor bronze flats with 100mm gaps
3. Slate walking surface
4. Phosphor bronze drainage grille
5. Discreet neoprene pads
6. Drainage fall on waterproofed steel structure
7. Discreet stiffeners
8. Drainage channel
9. Drainage outlet pipe at 12m centres
10. Longitudinal stiffners
11. Phosphor bronze roll bonded to external face of structural steel plate
12. Internal diaphragms at regular centres

1. Bearings
2. Exposed abutment face - precast concrete to match pillar

Bridge deck - cross section



Island landing - cross section



1. Precast concrete formwork
2. Reinforcement cage
3. In-situ concrete
4. Dowel connections between precast units

Roll-bonded structural steel

Roll-bonded structural steel is an innovative material solution to the problem of corrosion that also happens to provide a striking aesthetic. It consists of a conventional steel plate which is bonded to a thin layer of cladding material under intense heat and pressure. The resulting interface is practically unbreakable, and the composite plate boasts the protective benefits of the cladding along with the structural performance of the steel. Typically the cladding is either a stainless steel or a copper alloy. In this case a phosphor bronze is proposed, which consists of copper, tin and a small addition of phosphorus. It offers excellent sea-water corrosion resistance and a bright reddish colour which will dull down into attractive and richer red, brown and grey tones over time.

View from the coastal path

View from the Island

At the bottom of the ravine

View down the slate steps