

Dec 13th, 3:40 PM - 5:20 PM

Australia's first trap-and-haul fishway: Nerang River, Queensland

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An aerial photograph of a large dam and reservoir. The dam is a long, grey concrete structure extending from the left towards the center. To the right of the dam is a large, deep blue reservoir. In the foreground, there is a landscaped area with a parking lot, a circular green lawn, and some buildings. The background shows a dense forest of green trees, and in the far distance, a city skyline is visible under a clear blue sky.

A trap-and-haul fishway for multi-species upstream fish passage at a challenging site

Steve O'Brien, John Harris, Brent Mefford and David Roberts

Hinze Dam Stage 3

Raise Main Embankment
By 15m

Raise and Modify
Spillway

Spillway Chute





Existing Spillway

Existing Environmental
Flow Outlet

Existing River Channel

Upstream of Hinze Dam

Little Nerang River



Nerang River



Downstream of Hinze Dam

Environmental Flow 7.25ML/day



Upstream Fish Passage Requirements

- Upstream fish passage be implemented to rehabilitate the Nerang River's biological diversity and fisheries values
- All non-spilling flows (7.25ML/d) are available for fish transfer.
- The fishway's design and operation are to be flexible to accommodate variation in biomass.
- Fish passage to be available in floods up to the 1 in 20 AEP flood.

Downstream Fish Passage Requirements

- Continuous downstream fish passage is not required beyond spill events.
- Not enough flow in Nerang River downstream of the dam
- Minimal attraction flows to guide fish
- More likely to be transferring stocked fish
- Spillway design is to consider opportunities to minimise adverse effects on fish during and immediately after spill events.

Upstream Passage Options Considered

- Fishlift
- Series of Locks
- Fish Ladder
- **Trap and Haul**



Fishway Location





Fishway

Approach Pool

Barrier Weir







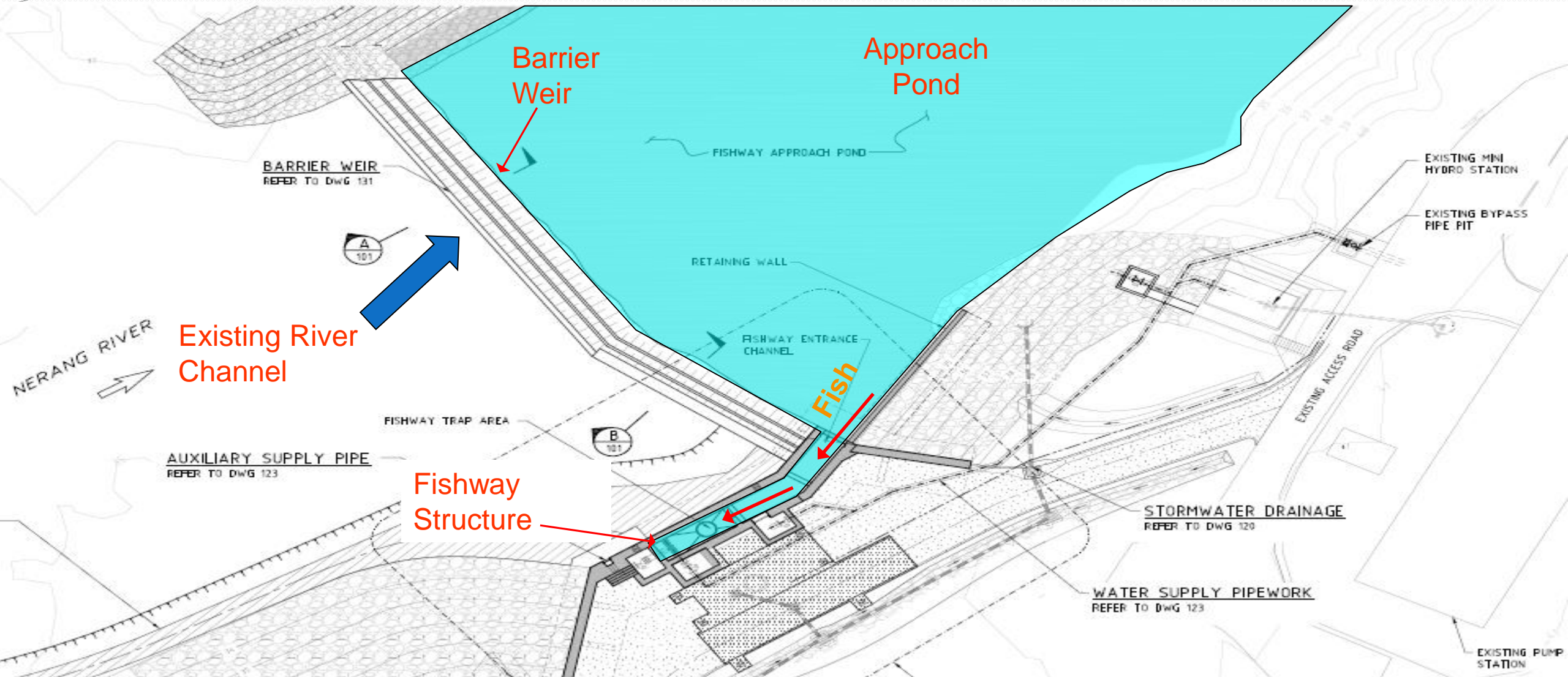
R12 R12
DO NOT
OVERLAKE
TURNING VEHICLE
Without Tracks
Assembly Steps
QDS
Without Tracks
Assembly Steps
QDS

500 lb
500 lb
500 lb

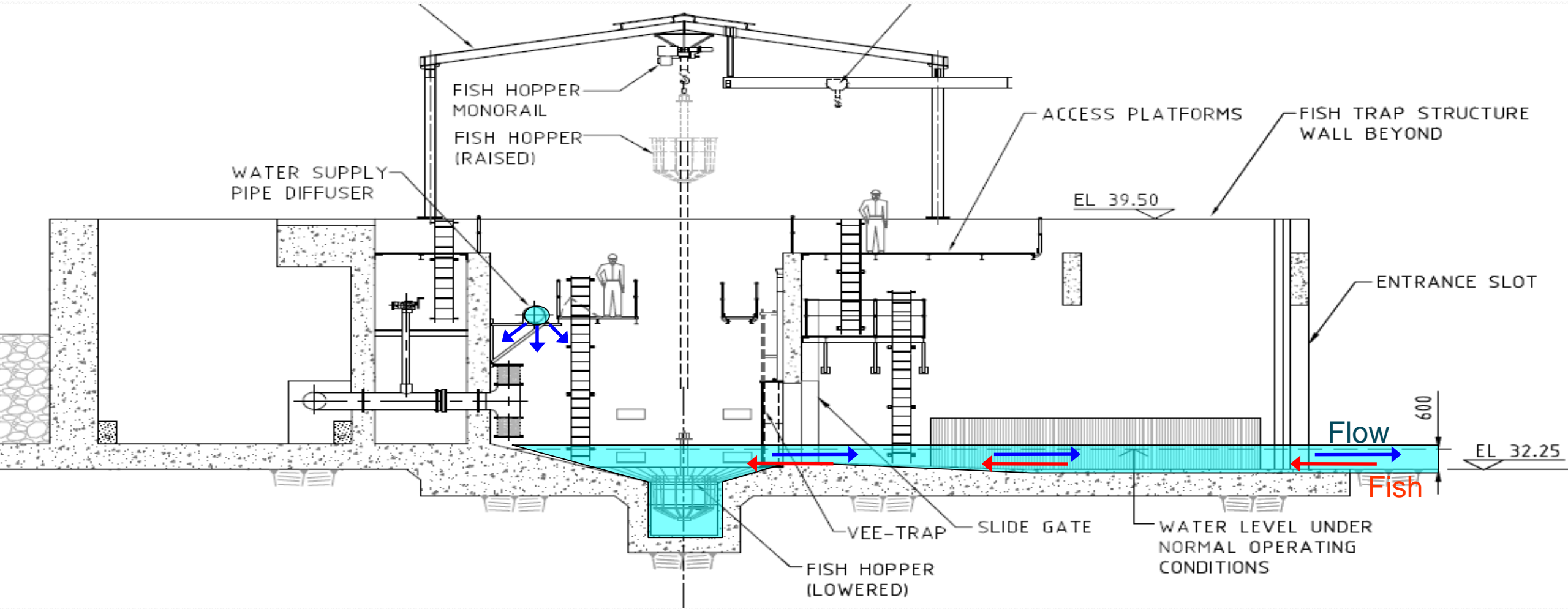
FIRST AID

FIRE

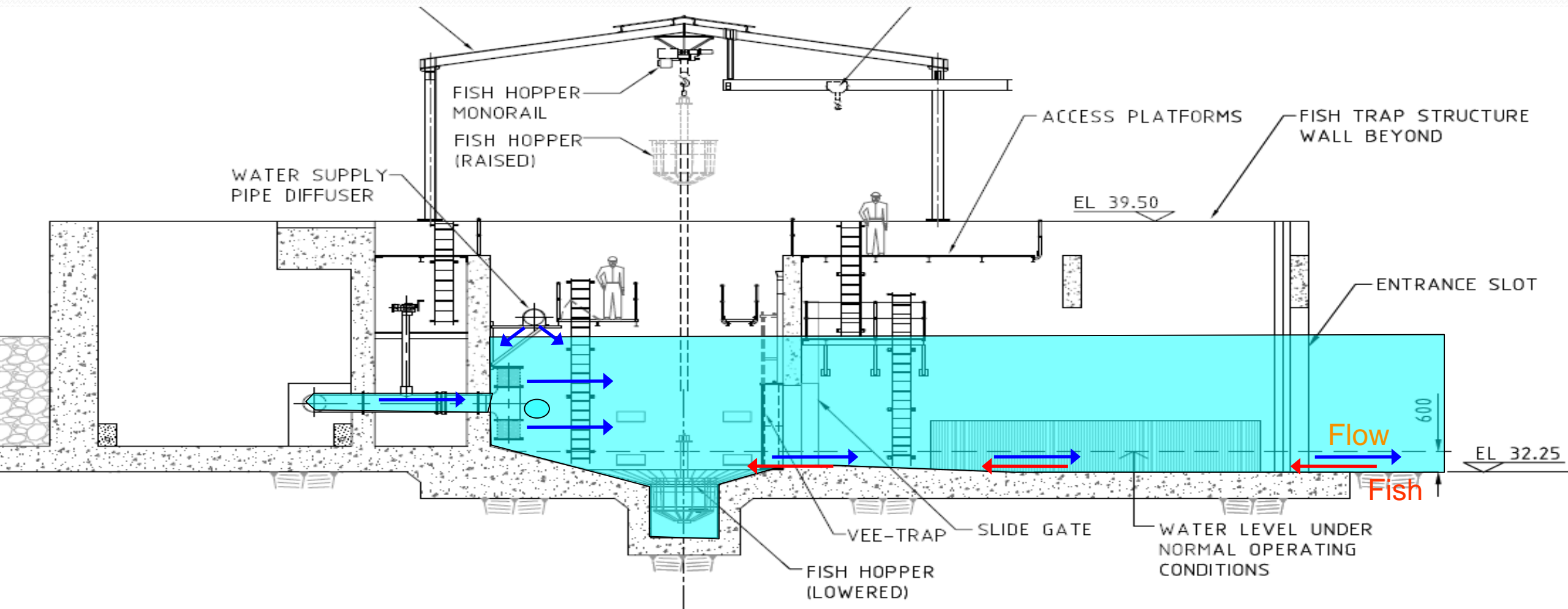
Fishway Design – Plan View

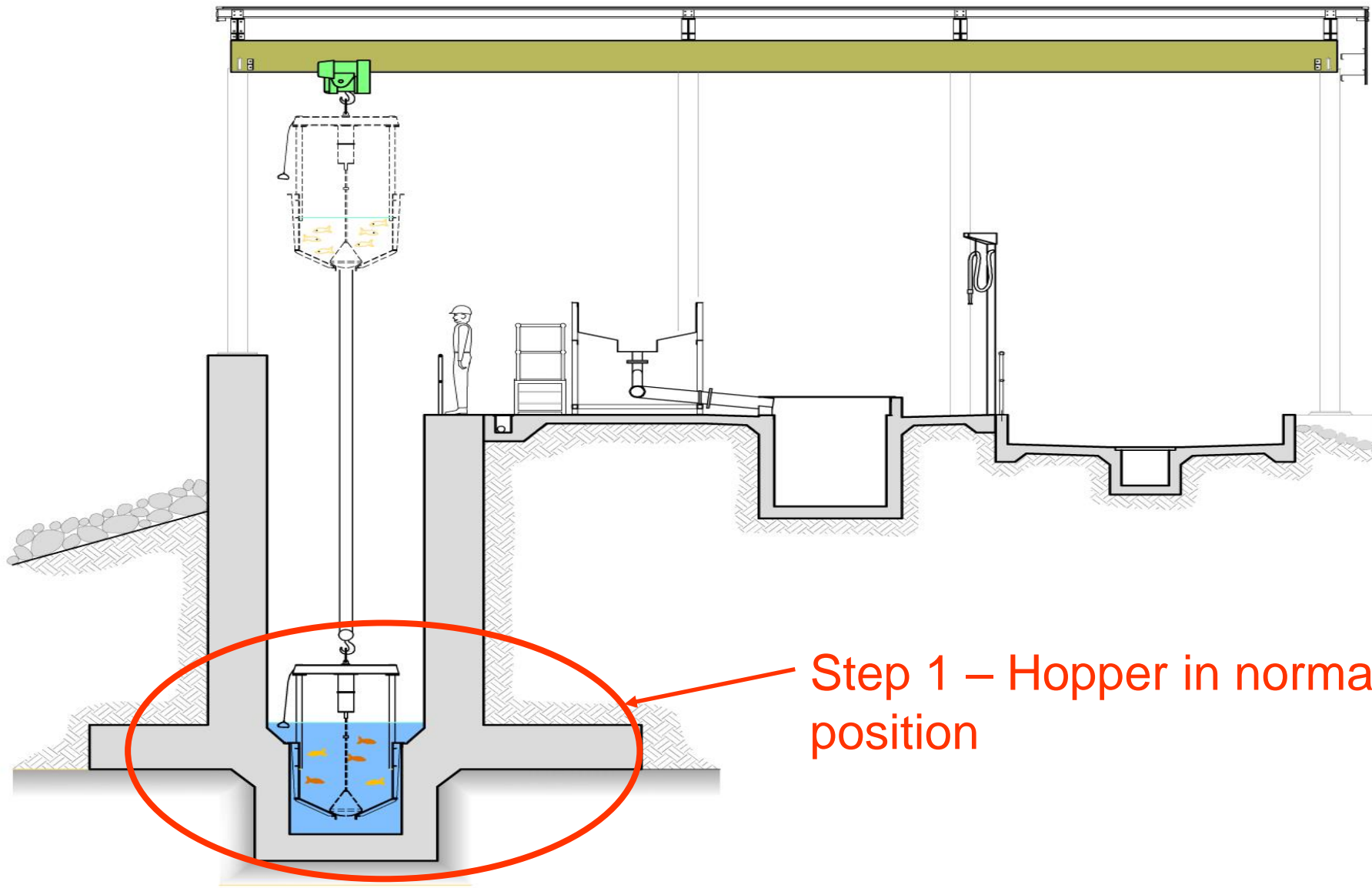


Section Through Fishway – Normal Operations

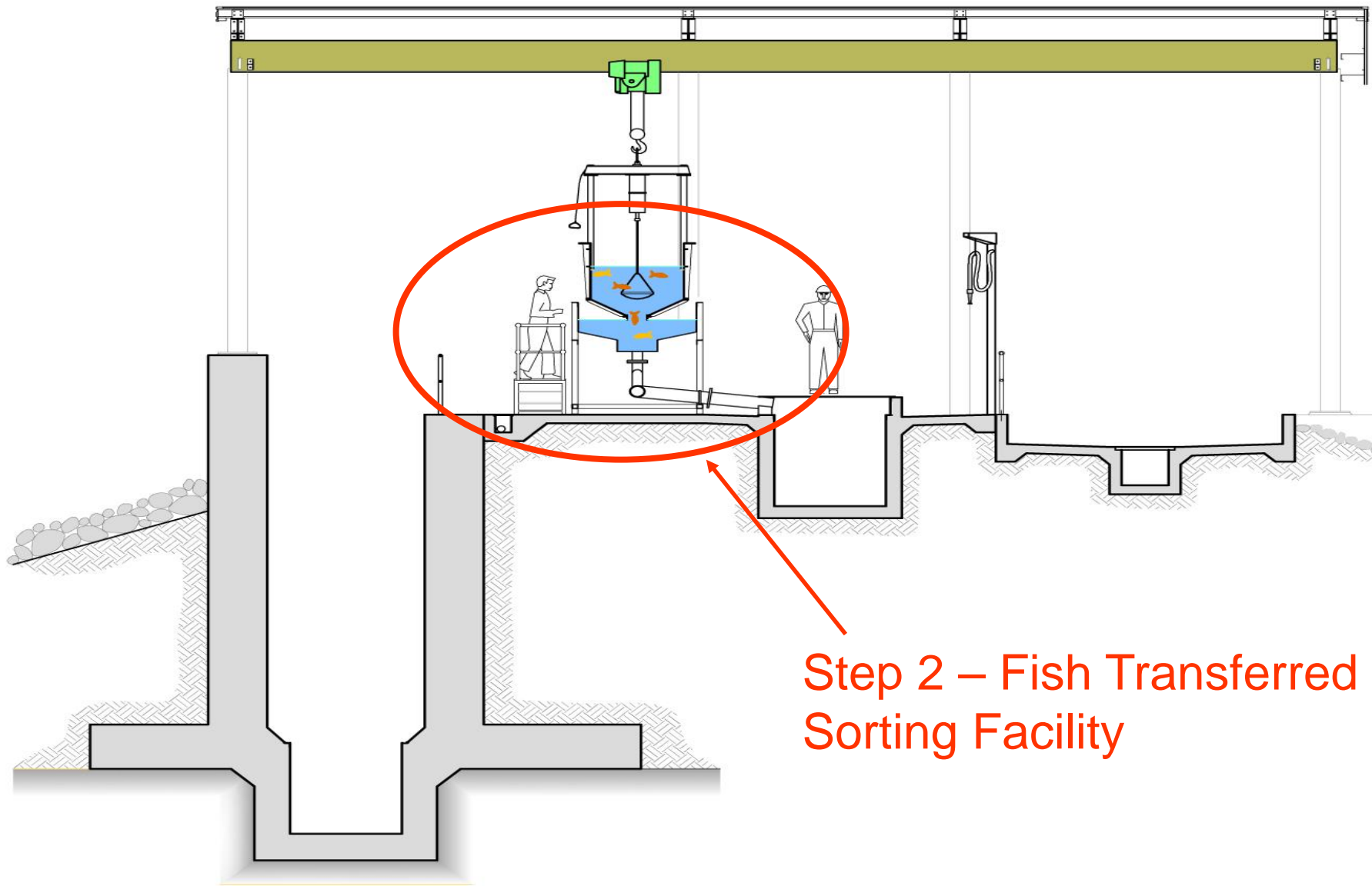


Section Through Fishway – Spill Events

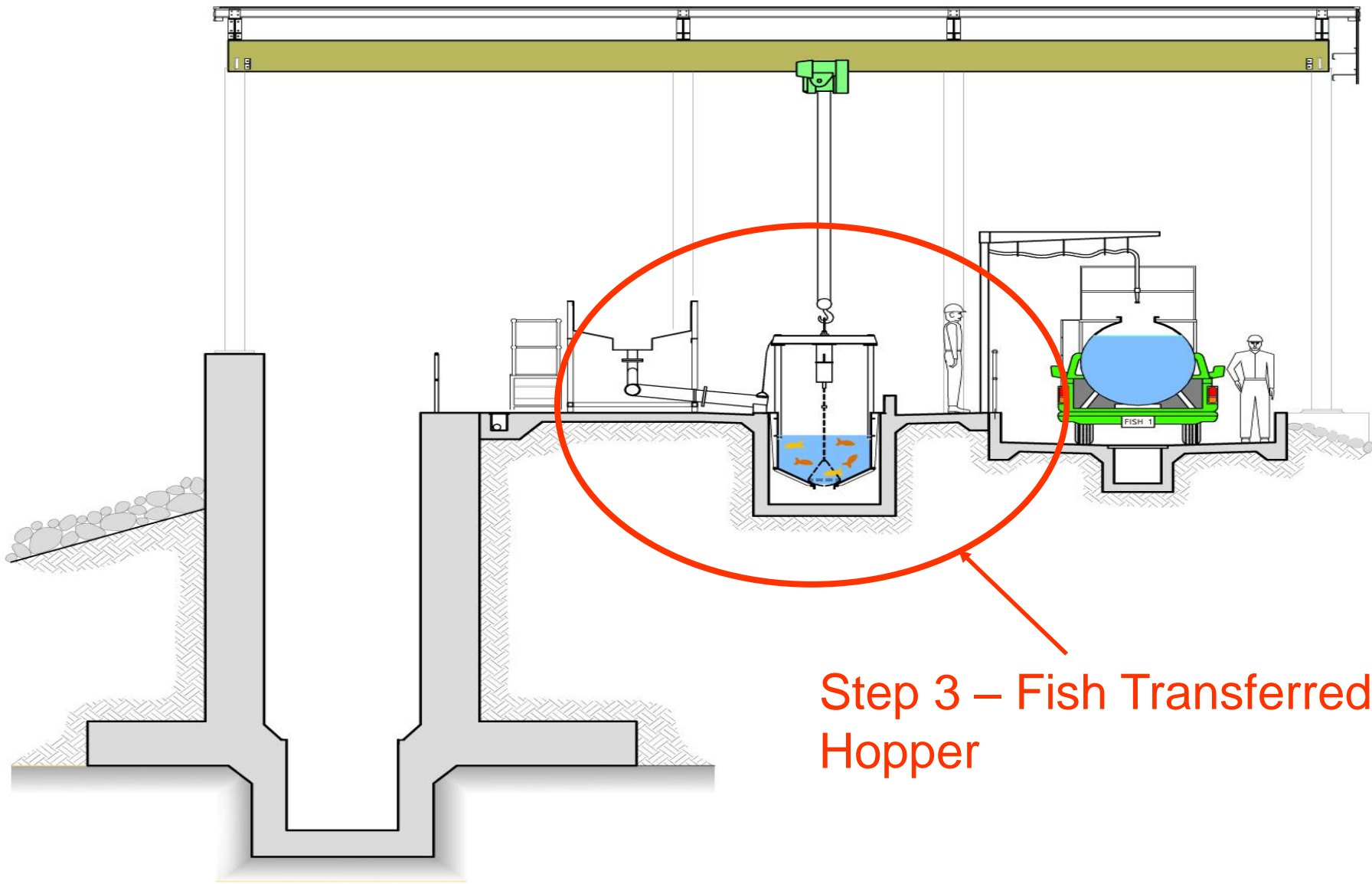




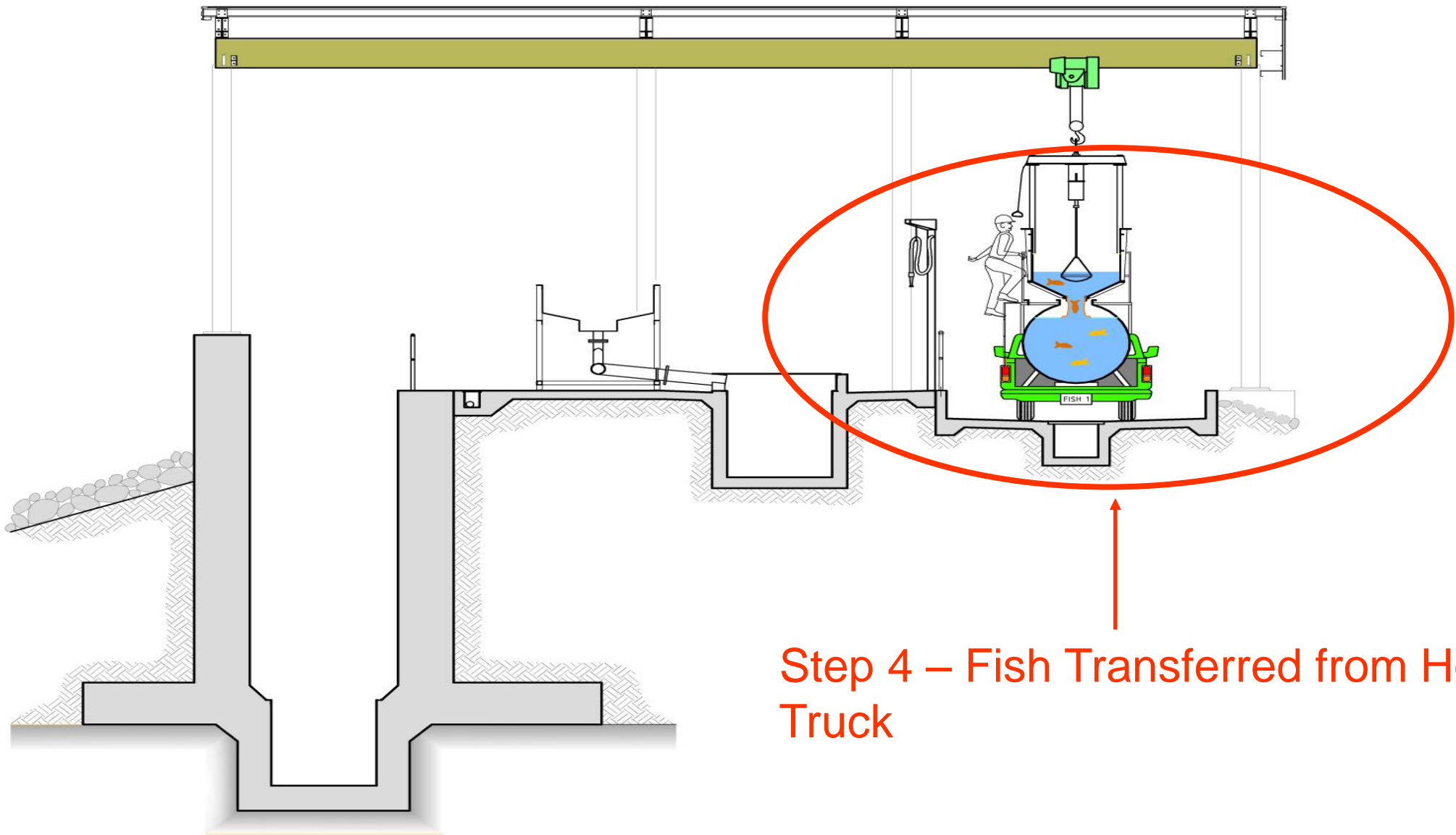
Step 1 – Hopper in normal operating position



Step 2 – Fish Transferred from Hopper to Sorting Facility



Step 3 – Fish Transferred back into Hopper



Step 4 – Fish Transferred from Hopper to Truck















13000 **Belco**

SONIC

AQUASONIC

MAX LOAD 4000kg
RADIAL
MAX SPEED 120km/h
MAX TORQUE 1500Nm

MAX LOAD 4000kg
RADIAL
MAX SPEED 120km/h
MAX TORQUE 1500Nm





Fishway Operation

- Can be operated by a single person
- Non Spill periods: operates between 1 to 4 times a week
- Spill periods: Up to 4 times per day.



Fishway Statistics

- Commissioned 2011
- Transferred 185,000 fish
- 23 fish species plus turtles
- Removed 45,000 pest species
- Highest 24hr catch of 13,700 fish



Successes

- Design and Construction
 - Fishway type suited the site conditions
 - Economical
 - Independent of the dam and upgrade works
 - Could be constructed and commissioned early in the project
 - Allows multiple release sites to manage predation

Successes

- Operation
 - Simple system with minimal maintenance requirements
 - Suitable for the full range of fish sizes and species
 - Flexible operation
 - Buy-in of operators
 - Operated up to 1 in 20 AEP flows

Improvements / Learnings

- Implemented:
 - New Cone-Trap arrangement
 - Minor modifications to the sorting facility



Improvements / Learnings

- Future:
 - Low flows reduce the effectiveness of attraction flows under normal operating conditions
 - Limited ability to increase flows – would be good to revisit release requirements
 - Upgrade of intake pipework could allow ‘flow banking’

Conclusions

- Developed an innovative trap and haul system that:
 - Meet all the key project requirements
 - Is an economical solution
 - Suits site conditions
 - Operates from standard low flow conditions up to 1 in 20 AEP flood
 - Provides flexibility
 - Ability to manage pest species
 - Capacity to manage predation
 - Future improvements could be provide by increasing flow capacity

