Schedule D
Spill Protocol Management Plans

In preparation of a spill

1. The licensee shall submit within 6 months of the date of this Order, for approval by the Comptroller, terms of reference, for the following spill preparation management programmes for the area downstream of W.A.C. Bennett to the confluence with the Pine River:
    a. *establish a network of baseline total gas pressure and temperature stations.*
2. The licensee shall implement the programmes in 1 above in accordance with the terms of reference accepted by the Comptroller of Water Rights.

In the event of a spill

3. The licensee shall submit within 6 months of the date of this Order, for approval by the Comptroller, terms of reference for the following monitoring programmes to be implemented in the event of a spill:
    a. *fish stranding below Peace Canyon Dam at specific sites up to the confluence of the Pine River during total discharge at the dam that exceeds a daily average of 2000 cubic metres per second for at least 2 days;*
    b. *spillway entrainment at W.A.C. Bennett Dam during spillway discharge that exceeds a daily average of 205 cubic metres per second for at least 2 days;*
    c. *changes in riparian habitat vegetation for 2 years following a total discharge from the Peace Canyon facility that exceeds a daily average of 2500 cubic metres per second for at least 2 days;*
    d. *side channel response in terms of habitat and morphological changes following an event when total discharge from the Peace Canyon facility that exceeds a daily average of 2500 cubic metres per second for at least 2 days;*
    e. *spill hydrology and operating conditions prior, during and after any of the following spill events:*
        i. *spill discharge from W.A.C. Bennett Dam that exceeds a daily average of 205 cubic metres per second for at least 2 days; or*
        ii. *spill discharge from the Peace Canyon facility that exceeds a daily average of 2000 cubic metres per second for at least 2 days or that exceeds a daily average of 500 cubic metres per second for at least 7 days.*

f. total gas pressure and temperature downstream of W.A.C. Bennett and Peace Canyon dams when spill discharge at

i. W.A.C. Bennett Dam that exceeds a daily average of 205 cubic metres per second for at least 2 days;

ii. spill discharge from the Peace Canyon facility that exceeds a daily average of 2000 cubic metres per second for at least 2 days;

iii. spill discharge from Peace Canyon Dam that exceeds a daily average of 500 cubic metres per second for at least 7 days or

iv. *spill discharge from Peace Canyon Dam that exceeds a daily average of 1500 cubic metres per second for at least 2 days .*

g. identify and map areas of flood plain and side channel inundation at flows that exceeds a daily average of 2000 cubic metres per second;

h. assess wildlife stranding during and following total discharge from Peace Canyon facility that exceeds a daily average of 2000 cubic metres per second for at least 2 days;

i. relative abundance and distribution of fish in Peace Arm of Williston Lake reservoir following a spill event when spill discharge from GM Shrum that exceeds a daily average of 205 cubic metres per second for at least 2 days.

4. The licensee shall implement the programmes in 3 above whenever a spill event occurs as variously defined above, in accordance with the terms of reference accepted by the Comptroller of Water Rights and shall provide timely data on these studies to federal and provincial fish agencies and report results to the Comptroller annually.

I HEREBY ORDER THAT:

1. In the event that operation below 655.32 metres (2150 feet) GSC as measured in the vicinity of Water Survey of Canada Gauge 07EF002 is expected at Williston Lake reservoir, the licensee is required to:

   a. obtain approval from the Comptroller of Water Rights at least six months prior to the expected date the reservoir would be drafted below 655.32 metres;

   b. obtain approval from the Comptroller of Water Rights as soon as possible in case of a force majeure event or low system supply event, to draft below 655.32; and

   c. if approval is granted, hold public meetings in the region as soon as practical to communicate the rationale for operations below 655.32 metres.

2. In the event of a force majeure or low system supply event, the licensee may draft Williston Lake reservoir below 654.41 metres (2147 feet) GSC to a specified lower elevation provided that prior approval is received from the Comptroller of Water Rights.

3. Pursuant to the results of studies as outlined in Schedule A 1, the Comptroller of Water Rights may reduce the elevation constraint in clause 2 above from 654.41 metres (2147 feet) GSC to some other level not lower than 652.27 metres (2140 feet) GSC.

4. The licensee shall make reservoir releases to provide a minimum flow of 283.17 cubic metres per second (10,000 cubic feet per second) in the Peace River as measured in the vicinity of Water Survey Canada Gauge 07EF001, near Hudson's Hope.

5. The licensee shall communicate in a timely manner with federal and provincial fisheries agencies and affected First Nations in the event that a spill from either W.A.C. Bennett Dam or Peace Canyon Dam:

   a. has a 25% or greater probability of occurring within the following 14 days;

   b. has increased in probability by 10% or more within the previous 24 hours; or

   c. is occurring or has occurred.

6. The licensee shall submit, for approval by the Comptroller, terms of reference for works, feasibility and monitoring studies for:

   a. Williston Lake reservoir as described in Schedule A;

   b. Dinosaur Lake reservoir as described in Schedule B;

   c. Peace River as described in Schedule C; and

   d. protocols in the event of spills, as described in Schedule D.

7. Within 9 months of the date of this order, the licensee shall submit, for approval by the Comptroller, terms of reference for

   a. an archaeological overview assessment of the drawdown zones of each of the Williston Lake and Dinosaur Lake reservoirs and within the Peace River channel between the Peace Canyon Dam and the confluence with the Alces River; and

   b. non-intrusive erosion monitoring of archaeological resources located in each of the Williston Lake and Dinosaur Lake reservoir drawdown zones and within the Peace River channel between the Peace Canyon Dam and the confluence with the Alces River.

8. With respect to the maintenance and provision of records the licensee must:

   a) keep records of

      i) generation discharge from G.M. Shrum and Peace Canyon Generating Stations;

      ii) spill discharge from W.A.C. Bennett and Peace Canyon Dams; and

      iii) elevations on Williston Lake and Dinosaur Lake reservoirs.

   b) provide a written report to the Comptroller of Water Rights on or before February 1 of each year summarizing the records from the previous calendar year; and

   c) provide on request of the Comptroller of Water Rights records collected under 8a).

9. The licensee may operate the works in an alternate manner in the event of an emergency, dam safety requirement, or extreme hydrological event.

10. All emergency operations or other deviations from operations ordered above shall be reported to the Comptroller of Water Rights in a timely manner.

Dated at Victoria, B.C., this 9th day of August, 2007.

Glen Davidson, P.Eng.
Deputy Comptroller of Water Rights

Schedule A

Williston Lake Reservoir

Industry engineering feasibility and design study

1. The licensee shall submit within 6 months of the date of this Order, for approval by the Comptroller, terms of reference for an engineering feasibility and design study to determine practical and cost-effective solutions to the following issues associated with lower reservoir levels:

   a. *water supply at Abitibi newsprint and Pope & Talbot pulp mills;*

   b. *effluent disposal at Abitibi newsprint mill, Pope & Talbot pulp mill and District of Mackenzie; and*

   c. *log supply for Canfor and Abitibi sawmills.*

Fish and Wildlife Habitat

2. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for the following works:

   a. *develop a wetlands inventory and create trial wetlands at specific sites around Williston Lake reservoir to improve foreshore habitat for fish and wildlife; and*

   b. *improve fish access on two trial tributaries around Williston Lake reservoir and maintenance of access through a debris survey and effective debris management.*

Shoreline

3. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference to:

   a. *conduct a dust source survey and reduce the duration and magnitude of dust storms around Williston Lake reservoir by way of dust control trials;*

   b. *control shoreline erosion in front of the Tsay Keh Village;*

   c. *conduct a debris survey and targeted debris removal; and*

   d. *map the reservoir between full pool and 652.27 metres (2140 feet) GSC.*

Reservoir Access

4. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for a feasibility study on reservoir access, evaluating improvements to access points as follows:

   a. *Peace Reach: relocation of access at Dunlevy and improvement of access at Elizabeth Creek;*

b. *Finlay Reach: new access at Ingenika and Fort Ware, and improvements to the Tsay Keh Village barge landing and*

c. *Parsnip Reach: improvement of access at Finlay Bay, 6-Mile Bay, Black Water or Manson Dump, Alexander Mackenzie's Landing, Standberg and Cutthumb Bay.*

5. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for maintenance and enhancement of reliable and safe navigational access at sites on Williston Lake Reservoir through a combination of:

a. *targeted debris removal following the survey in 3(c) above,*

b. *signage to provide location information of access facilities and hazards associated with operations; and*

c. *radio repeater station(s) to enhance communication to boaters.*

Effectiveness Monitoring

6. The licensee shall submit within 12 months of the date of this Order, for approval by the Comptroller, terms of reference for the following effectiveness monitoring programmes on Williston Lake reservoir to determine:

a. *the effect of the operation of Williston Lake reservoir on silt deposition in the Finlay River at Deserter's Canyon;*

b. *the benefits of the trial wetlands for fish and wildlife in 2 a above;*

c. *the benefits of the trial tributary habitat enhancements in 2.b above;*

d. *the benefits of the dust control programme in 3 a above;*

e. *the effectiveness of erosion control measures in 3 b above;*

f. *recreation use and benefits at improved or new access sites identified in 4 a, b, and c above; and*

g. *the change in debris trends associated with the extent, movement and recruitment of debris and the effectiveness of targeted debris removal in 5 a above.*

Implementation

7. The licensee shall implement the above works, feasibility and monitoring studies in accordance with the terms of reference accepted by the Comptroller of Water Rights and shall report progress on these projects to the Comptroller annually until their conclusion.

Schedule B

Dinosaur Lake Reservoir

Fish Habitat

1. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for:
   a. *a survey to establish the extent and number of tributaries affected by debris fields and reservoir operations; and*
   b. *a subsequent feasibility study to determine whether works can improve access for fish at a number of tributaries.*

Reservoir Access

2. The licensee shall submit within 12 months of the date of this Order, for approval by the Comptroller, terms of reference for:
   a. *a study to evaluate improved access by relocating and improving the dock at Hudson's Hope Park; and*
   b. *a study to evaluate signage at Hudson's Hope Park to display information about the current reservoir levels.*

Effectiveness Monitoring

3. The licensee shall submit within 12 months of the date of this Order, for approval by the Comptroller, terms of reference for the following monitoring programme:
   a. *effectiveness of any tributary enhancement works resulting from 1.b above.*

Implementation

4. The licensee shall implement the above works, feasibility and monitoring studies in accordance with the terms of reference accepted by the Comptroller of Water Rights and shall report progress on these projects to the Comptroller annually until their conclusion.

Schedule C

Peace River

Fish and Wildlife Habitat

1. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for the following works and feasibility studies between Peace Canyon Dam and the Pine River confluence:
   a. *improve fisheries habitat and productivity in Peace River side channels by modifying several trial side channels to improve rearing habitat*
   b. *identify and map areas of flood plain and side channel inundation at flows less than 2000 cubic metres per second; and*
   c. *identify and assess riparian habitat.*

River Access

2. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for a study to improve boat ramp access to the river at
   a. *Lynx Creek;* – feasibility study work done.
   b. *Halfway River;*
   c. *Peace Island Park; and* – feasibility study work done
   d. *Clayhurst/Blackfoot Regional Park.*
3. The licensee shall submit within 9 months of the date of this Order, for approval by the Comptroller, terms of reference for maintenance and enhancement of reliable and safe navigational access between Peace Canyon Dam and the Pine River confluence through
   a. *radio repeater station(s) to enhance communication to boaters.*

Effectiveness Monitoring

4. The licensee shall submit within 12 months of the date of this Order, for approval by the Comptroller, terms of reference for the following effectiveness monitoring programmes on Peace River between Peace Canyon Dam and the confluence with the Pine River:
   a. *conduct a creel survey to monitor impacts from sport fishing;*
   b. *monitor population trends for whitefish, bull trout and arctic grayling;*
   c. *monitor changes in periphyton communities as affected by changes in flow from Peace Canyon Dam;*

d. *monitor side channel fisheries habitat in Peace River to assess the efficacy of the trial side channel enhancements and*

e. *the effect of Peace Canyon flow releases on water turbidity and temperature at the Spectra Energy facility, Canfor-Taylor pulp mill and the District of Taylor water supply*[1].

Implementation

5. The licensee shall implement the above works, feasibility and monitoring studies in accordance with the terms of reference accepted by the Comptroller of Water Rights and shall report results to the Comptroller annually until their conclusion.

[1] in partnership with Canfor Forest Products, District of Taylor and Spectra Energy

Province of British Columbia
Water Act

Peace Order
Water Act
Section 88

File No. 76975-35/Peace

WHEREAS British Columbia Hydro and Power Authority (BC Hydro) is the operator of the G.M. Shrum and Peace Canyon Generating Stations, W.A.C. Bennett and Peace Canyon Dams, and Williston Lake and Dinosaur Lake reservoirs, in respect of which it holds Conditional Water Licences 27721, 27722, 42203, 43431 and 49679;

WHEREAS BC Hydro has engaged in public consultation to determine values for system parameters and to develop operating procedures which may provide benefits as described below;

WHEREAS the licensee has submitted the Peace Project Water Use Plan, which recommends changes to the operations of the G.M. Shrum and Peace Canyon hydro-electric facilities and works which are intended to benefit fish, wildlife, industry, recreation, local residents and shoreline conditions;

WHEREAS the Peace Project Water Use Plan proposes a monitoring programme to determine whether the works and operating the project in accordance with the operating parameters and procedures in the Plan will provide the expected benefits;

WHEREAS I have accepted the Peace Project Water Use Plan dated August, 2007; and

WHEREAS the following terminology is used in this Order:

Force Majeure is an unplanned partial or complete failure of, or damage to, generation or transmission equipment or related assets and facilities, including unavailability of same due to statutory, regulatory, and legal processes and orders, that results in a reduction in the actual or expected generation resources available to the BC Hydro system.

Low System Supply is a period of one or more years in which inflows (energy equivalent) into BC Hydro reservoirs are significantly less than average.

Province of British Columbia

WATER RESOURCES SERVICE
WATER RIGHTS BRANCH

Department of Lands, Forests, and Water Resources

CONDITIONAL WATER LICENCE

British Columbia Hydro and Power Authority of Vancouver, B.C., is hereby authorized to divert and use water as follows:-

(a) The source of the water-supply is Peace River.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 18th January, 1974.

(d) The purpose for which the water is to be used is power.

(e) The maximum quantity of water which may be diverted is 70,000 cubic feet per second, and such additional quantity as the Engineer may from time to time determine should be allowed for losses.

(f) The period of the year during which the water may be used is the whole year.

(g) This licence is appurtenant to the undertaking of the licensee.

(h) The works authorized to be constructed are a dam, penstocks, power house, spillway and related works in the location shown on the attached plan.

(i) The construction of the said works shall be commenced on or before the 31st day of December, 1975, and shall be completed and the water beneficially used on or before the 31st day of December, 1985.

(j) The licensee shall not commence construction of any part of the works authorized under clause (h) hereof until the plans for such part have been approved by the Comptroller of Water Rights.

(k) The rights granted under this licence shall be deemed to be subsequent to any rights granted under any licence or licences that may be issued at any time for the consumptive use of water.

(l) The flooded area shall be cleared to such extent and in such manner as shall be directed by the Comptroller of Water Rights.

(m) The location of access roads, borrow pits and similar works shall be subject to the approval of the Comptroller of Water Rights.

(n) Programmes for the protection or enhancement of fish and wildlife habitat shall be carried out as directed by the Comptroller of Water Rights after consultation with the licensee and the Department of Recreation and Conservation.

(o) Public access to the reservoir and related recreational facilities shall be provided and maintained as directed by the Comptroller of Water Rights after consultation with the licensee and the Department of Recreation and Conservation.

H. D. DeBeck,
Comptroller of Water Rights.

File No. 0322380 Date issued: 26 April, 1974 Conditional Licence No. 42203

ORDER

WATER ACT

File No. 0322380

In the matter of Conditional Water Licence 42203, which authorizes the diversion and use of water from the Peace River by British Columbia Hydro and Power Authority for power purposes; and

Pursuant to clause (o) of the said licence, which makes provision for public access to and related recreational facilities on the reservoir so formed;

It is hereby ordered that the programme set out in an agreement between the licensee and Her Majesty the Queen in Right of the Province of British Columbia, dated 10 April, 1980, and attached to this Order as Appendix "A", be carried out as provided in the said agreement.

Dated at Victoria, British Columbia, this 8th day of May, 1980.

H. D. DeBeck,
Comptroller of Water Rights.

THIS AGREEMENT dated as of the 6th day of April 1980.

BETWEEN:

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY,
a Company organized under the laws of British
Columbia and having an office at 555 West Hastings
Street, Vancouver, British Columbia

(herein called the "Hydro")

OF THE FIRST PART,

AND:

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE
OF BRITISH COLUMBIA, represented by the Minister
of Lands, Parks and Housing

(herein called the "Province")

OF THE SECOND PART.

WITNESSES THAT WHEREAS:

A. Hydro has constructed a dam (herein called the "Site 1 Dam") and other works for a hydro-electric generation project on the Peace River in British Columbia and the construction of the Site 1 Dam has created a reservoir (herein called the "Peace Canyon Reservoir").

B. The Province is familiar with and knowledgeable about recreational facilities and has, at an earlier time, assessed and placed in priority such recreational opportunities and has expressed the opinion that recreational facilities (herein called the "Facilities") should be provided on the Peace Canyon Reservoir.

C. The Facilities will be developed in phases as required, the particulars of which are described in Schedule "A".

Hydro and the Province agree that the Facilities as set forth in this Agreement constitute the entire compensation payable by Hydro for recreation, as required under clause "O" of the CONDITIONAL WATER LICENCE, Number 42203, File Number 0322380, issued 26 April 1974 for Site 1.

NOW THEREFORE in consideration of the premises and of the covenants and agreements set forth below, the parties agree as follows:

1. The Province will:

(a) select and acquire a site (herein called the "Site") for the Phase I Facilities near the Site 1 Dam,

(b) prepare and provide to Hydro, without cost to Hydro, all technical and other design data, plans, and specifications (herein called the "Plans and Specifications") for the construction of the Phase I Facilities consisting of an access road to the Site, a parking lot, a boat ramp, certain bank developments and a combination day-use/overnight parking lot.

(c) use its best efforts to design the Phase I Facilities in a manner that will keep material, equipment and operation costs in line with costs experienced by the Province on the construction of similar recreational facilities in the Province of British Columbia.

(d) promptly provide to Hydro, without cost to Hydro, when requested by Hydro, all necessary design details for park standard furnishings specified in the Plans and Specifications.

2. Hydro will:

(a) assist the Province in the design of Phase I Facilities and in the planning of the operation of the same,

(b) provide labour, construction equipment and materials without cost or expense to the Province, to construct or cause to construct the Phase I Facilities in accordance with the Plans and Specifications provided by the Province,

(c) operate, without cost or expense to the Province, the Phase I Facilities for such period of time (not exceeding five years after the construction of the Phase I Facilities has been substantially completed) as the Province may deem necessary to evaluate the effectiveness and efficiency of the Phase I Facilities.

(d) during the period Hydro operates the facilities under clause 2 (c), Hydro will indemnify and save harmless the Province, its servants and agents, from and against any and all claims, demands or actions for personal injury, loss or damage arising out of or incidental to the establishment, maintenance and operation of the facilities by Hydro.

(e) commencing on the first anniversary of the date of substantial completion of the Phase I Facilities and thereafter on the same date of each successive year the Phase I Facilities are operated by Hydro, prepare and deliver to the Comptroller of Water Rights, and the Province, a report in writing evaluating the operation of the Phase I Facilities.

3. The Province and Hydro will each designate, from time to time, a representative who is authorized to represent the party appointing him in connection with the design, construction, operation and evaluation of the Phase I Facilities under this Agreement.

4. Within 5 years after the construction of the Phase I Facilities, the Comptroller of Water Rights, in consultation with the Province and Hydro, will determine whether or not the public demand (based on annual user rates of the Phase I Facilities) justifies the development of the second and third phases of the Facilities, or either of the phases, and the decision of the Comptroller of Water Rights will be final and binding on the parties. At that time, the Comptroller of Water Rights shall determine the respective responsibilities of the parties for the continued operation and associated costs for the Phase I Facilities. If the Comptroller of Water Rights directs that Phases II and/or III be constructed, Hydro will pay the capital costs of the construction, the Province will prepare the necessary Plans and Specifications, and the parties to this Agreement will accept the determination of the Comptroller of Water Rights, or his successor, regarding the costs of constructing and operating Phases II and III of the Facilities.

5. In the event of a dispute arising between the parties concerning any provision of this Agreement, the matter in dispute will be referred to the Comptroller of Water Rights, as defined in the Water Act, R.S.B.C. 1960, c 405, and his decision will be final.

IN WITNESS WHEREOF the parties have executed this Agreement as of the date first above written.

The Common Seal of British Columbia Hydro and Power Authority was hereunto affixed in the presence of:

Authorized Signatory

Authorized Signatory

SIGNED, SEALED AND DELIVERED by a duly authorized representative of the Minister of Lands, Parks and Housing on behalf of Her Majesty the Queen in Right of the Province of British Columbia in the presence of:

REGISTERED 135101 (b)

SCHEDULE "A"

Phases for development of recreation facilities in the Peace Canyon Reservoir.

Phase I

(a) Access Road - approximately 1 mile in length

Boat Launching Ramp

Parking Lot and Channel

Site Clearing and Landscaping

(b) Combination Day-Use/Overnight Parking Lot

Phase II

Standard design 60 unit campground

Phase III

Ten boat access recreational sites on the Peace Canyon Reservoir. To be developed at specific sites yet to be identified.

Timing for Developments

Phase I to be implemented immediately.

Phases II and III to be implemented on the basis of demonstrated public need as determined by use, with development to be initiated by orders issued by the Comptroller of Water Rights pursuant to the Water Act, and Clause "O" of the Conditional Water Licence Number 42203.

80855.01

ORDER

WATER ACT

File No. 0322380

In the matter of Conditional Water Licence 42203, which authorizes the diversion and use of water from the Peace River by British Columbia Hydro and Power Authority for power purposes; and

Pursuant to clause (n) of the said licence, which makes provision for programmes for the protection or enhancement of fish and wildlife habitat,

It is hereby ordered that the programme set out in an agreement between the licensee and the Ministry of Environment of the Province of British Columbia, dated 10 April, 1980, and attached to this Order as Appendix "A", be carried out as provided in the said agreement.

Dated at Victoria, British Columbia, this 8th day of May, 1980.

H. D. DeBeck,
Comptroller of Water Rights.

76940/70

0322380
Peace Canyon Dam 80835.02

THIS MEMORANDUM made as of the 10th day of April 1980

contains the entire Agreement:

BETWEEN:

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY
(herein called "Hydro")

OF THE FIRST PART,

AND:

THE MINISTRY OF THE ENVIRONMENT OF THE PROVINCE OF BRITISH COLUMBIA
(herein called "The Ministry")

OF THE SECOND PART.

WHEREAS:

A. Hydro has constructed a dam and other works for a hydro-electric generation project (herein called "Peace Canyon") on the Peace River in British Columbia.

B. The Ministry has extensive and successful experience in fish culture, and has, at an earlier time, assessed fish production opportunities within the Peace Canyon reservoir area and desires to study and test the feasibility of establishing a fishery in the Peace Canyon reservoir part of the Peace River by a fishery pilot program (herein called the "Pilot Program").

C. A fundamental requirement for successful implementation of the Pilot Program is the assured existence and availability of an adequate supply of water of suitable quality and quantity.

D. The Pilot Program will be a hatchery for artificial propagation of 50,000, more or less, rainbow trout yearlings for year of operation and the hatchery will be enclosed and heated, to maximize security and minimize predation problems.

E. Hydro and the Ministry agree that the Pilot Program is a one-time only venture of specific duration, except as provided in the Agreement, for the Peace Canyon reservoir and agree that fulfillment of the Pilot Program, and any further direction of the Comptroller, as set forth in the Agreement, constitutes the entire compensation payable by Hydro, for the fishery, as required under clause "n" of the Conditional Water License No. 42203, file No. 0322380, issued 26 April 1974, for Site One (Peace Canyon).

NOW THEREFORE THIS AGREEMENT WITNESSETH THAT pursuant to the premises and in consideration of the covenants and agreements herein set forth, the parties covenant and agree as follows:

Article 1. The Ministry will:

(a) through Fish Culture Section, Fish and Wildlife Branch, provide to Hydro all biological and technical and other design data, plans and specifications for a hatchery for a site provided by Hydro at or near the G.M. Shrum powerplant and such design shall be generally, in accordance with the plans and specifications in the proposal (herein called the "Proposal" and set forth as Schedule "A" to this Agreement) provided by Fish and Wildlife Branch in a letter of 9 November 1979 to Mr. H. DeBeck, Comptroller of Water Rights.

(b) provide, when requested by Hydro, all necessary and sufficient materials and scientific equipment, as available, other than readily available construction materials, required for the construction and operation of the hatchery.

(c) through Fish Culture Section, Fish and Wildlife Branch, operate the hatchery, at Hydro's cost, for a period of the Pilot Program (not more than 5 years after substantial completion of the hatchery) and during such period provide to Hydro the opportunity to review all aspects of the Pilot Program.

(d) use their best efforts to minimize all costs of material and scientific equipment, construction and operation and keep them within the estimates set forth in the Proposal.

(e) provide invoices to Hydro for all costs reasonably and properly incurred by the Ministry in connection with all materials and scientific equipment, outside consultation on design, construction, operation and maintenance of the hatchery.

(f) maintain suitable, complete and current records of all costs of material and scientific equipment, outside consultation on design, construction, operation and maintenance of the hatchery and make such records available to Hydro.

Article 2. Hydro will:

(a) after consultation with the Ministry, select and provide a site for the hatchery suitable to the Ministry.

(b) assist the Ministry in the design of the hatchery for the site and in the planning of the operation of the same.

(c) use its best efforts to provide and maintain to the hatchery an adequate supply of water of suitable quality and quantity as set forth in the Proposal.

(d) pay to the Ministry, upon receiving an invoice from the same, all costs reasonably and properly incurred by the Ministry, in connection with the supply of materials and scientific equipment, outside consultation on design, construction materials, operating staff and maintenance for the hatchery.

(e) permit access of a reasonable number of agents, servants or employees of the Ministry to the site of the hatchery.

Article 3. The Ministry and Hydro will:

(a) jointly concur upon and select a suitable agency with the capability of expeditiously and efficiently constructing the hatchery and that agency shall provide labour and construction equipment at the cost to Hydro to construct the hatchery in accordance with the technical and other design data, plans and specifications provided by the Ministry.

(b) each of them designate, from time to time, a person on behalf of and responsible to his respective party for all aspects of the design, construction, operation and evaluation of the hatchery Pilot Program, in which the Ministry will assume the lead role.

(c) commencing one year after substantial completion of the hatchery and continuing every year thereafter until the end of the Pilot Program, jointly or separately, prepare a brief report in writing containing all necessary and sufficient particulars and evaluations of the operation and forward same to the Comptroller of Water Rights.

(d) jointly establish the basis for evaluation of the hatchery within 2 years of this Agreement.

(e) jointly encourage, develop and agree to all medial releases and reports made available to the public regarding the Pilot Program.

(f) at the conclusion of the Pilot Program, evaluate, and jointly, or separately, make a submission to the Comptroller of Water Rights, together with a recommendation on whether the hatchery be abandoned or be continued for the life of the Peace Canyon hydro-electric generation project. In the event the Comptroller of Water Rights directs that the fishery compensation be continued, the parties to this Agreement will accept the determination of the Comptroller on the matter of the annual operation costs of the hatchery and all other matters associated with the continued operation of the hatchery. Alternatively, in the event the Comptroller of Water Rights directs the project be

abandoned, the disposition of the facilities will be at the direction of the Comptroller and any further Fisheries compensation in the Peace River Valley of British Columbia would be at the direction of the Comptroller.

Article 4. Any injury or death to or loss of property of a person not employed on this project as an agent, servant or employee of a party to this Agreement shall be the obligation and liability solely of the party causing that injury, death, damage to or loss of property howsoever arising.

Any party to this Agreement causing injury, death or damage to or loss of property of a person not employed on this project as an agent, servant or employee of a party shall indemnify and hold harmless the other parties against all claims, demands, actions, liabilities, costs, losses, assessments, damages, fees and expenses whatsoever which may arise out of the performance of this Agreement.

Article 5. The parties will attempt to expeditiously resolve between themselves any disputes as to the interpretation of any provision in this Agreement or as to any matter regarding the Joint Agreement or the parties or their representatives. In the event the representatives of the parties are unable to resolve any dispute promptly, the matter shall be referred to the Chief Engineer, Hydro, and Director, Fish and Wildlife Branch, Ministry of the Environment, or failing resolution by the parties, the matter shall be referred to the Comptroller of Water Rights whose decision is final.

IN WITNESS WHEREOF British Columbia and Power Authority and the Government of the Province of British Columbia as represented by the Minister of the Environment has each executed this Agreement as of the date hereof.

APPROVED
to form only
Solicitor
B.C. HYDRO

(SEAL)

REGISTERED
13510
(a)

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

By: _____

By: _____
ASSOCIATE SECRETARY

Date: _____

GOVERNMENT OF THE PROVINCE OF BRITISH COLUMBIA

By: _____

Date: _____

In the presence of:

_____
Witness

PROPOSAL FOR A FISHERY COMPENSATION PROGRAM AT SITE ONE

B.C. FISH & WILDLIFE BRANCH

NOVEMBER, 1979

File: 0168

Mr. H. DeBeck
Comptroller of Water Rights
Water Management Branch
Ministry of Environment
Parliament Buildings
Victoria, B.C.
V8V 1X4

PROPOSAL FOR RAINBOW TROUT FISHERIES COMPENSATION IN THE SITE ONE RESERVOIR

Between August, 1975, and July, 1977, fish production opportunities within the Site One reservoir area were assessed and priorized by the Fish and Wildlife Branch.

The options identified and investigated were as follows: (i) construction of semi-natural facilities such as a spawning channel or artificial incubation and rearing facilities--in essence a mini-hatchery, (ii) enhancement of reservoir tributary streams to increase production, and (iii) maintenance stocking of the reservoir from existing Provincial hatcheries.

Option (ii) was eliminated due to unsuitability of existing stream habitat and unreliable water quality. Elimination of the third option was based on Fish and Wildlife Branch policy that transfer of fish between the Pacific and Arctic drainages should not occur, and because of concern for the

. . . 2

inherent suitability of non-resident stock.

Artificial Production Facilities

Lack of significant enhancement possibilities in reservoir tributaries re-focused attention on a spawning channel proposal near the base of the Bennett Dam. Upon further consideration, the earlier concept of a traditional spawning channel was abandoned, and emphasis was placed on development of box incubators and rearing tanks for rainbow trout. The major criteria for successful establishment of such an on-site mini-hatchery are as follows: -

1. Potential Water Source

The fundamental requirement for successful implementation of the proposal is the existence and availability of adequate supplies of water of suitable quality. Appendix I details the quantities and quality parameters required for this project. Three potential sources were identified but further assessment, hopefully aided by knowledgeable engineering staff of B.C. Hydro, is required in locating the best supply. The sources, in descending order of suitability, are: (i) the 15 cm diameter heated water line from the G.M. Shrum plant to the warehouse at the base of the dam, (ii) the small intermittent tributary at

. . . 3

the north end of the back channel which passes through the potential culture site, and (iii) a pumped supply from the tailrace or back channel which would have to be heated and probably aerated.

2. Site Location

The recommended site for the proposed facility is near the base of the Bennett Dam, at the North end of a large back channel separated from the tailrace proper by a rock and gravel groyne (see attached map). Input from B.C. Hydro engineers as to the ultimate suitability of any chosen site would be solicited.

3. Brood Stock Selection

The ultimate success of this proposal depends to a great extent on the use of resident brood stock. At present, there are angling closures in the area to protect such potential brood stock. There are several sites where collection is possible and more than one collection site may be necessary.

4. Design and Cost

In form and function the present proposal utilizes trout production facilities not unlike those adjacent

. . . 4

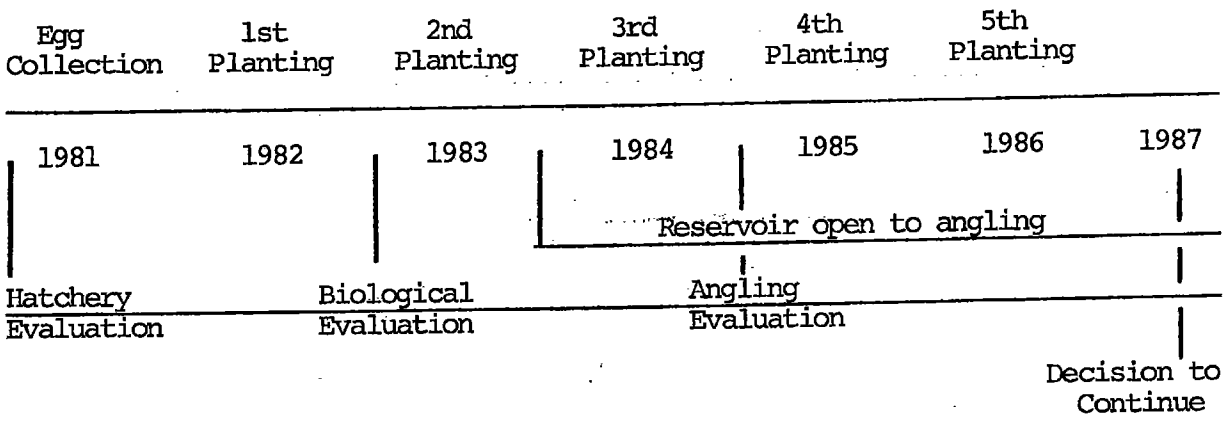
to the Meadow Creek Kokanee spawning channel. Fish culture facilities would be enclosed in a heated, insulated building to minimize security and predation problems.

The attached drawings (Appendix II) illustrate the likely facility design. Appendix III is a rough cost breakdown. It must be noted that cost estimates given are very preliminary, and could be subject to considerable revision as construction and material costs will undoubtedly rise in future.

The project as conceived will be a pilot operation, and is designed to test the feasibility of artificially maintaining the canyon fishery. Actual fish production should be continued for a minimum of five years, during which time an ongoing program of evaluation will be carried out to determine the project's success. Should this initial pilot be judged successful, the production facilities would become operational for the life of the Site One hydro-electric project.

We foresee tentative scheduling of fish production and evaluation as follows: -

. . . 5



We envisage this as a co-operative venture between B.C. Hydro and the Fish and Wildlife Branch. The annual operational costs would be borne by Hydro and the facility would be operated by the Branch. The evaluation program would involve marking of annual trout releases from the facility, sampling within and downstream of the reservoir, stream surveys, and angler interviews.

FISH AND WILDLIFE BRANCH
November, 1979.

Appendix I. Water quantity and quality criteria for proposed fish culture facilities for Site One Reservoir.

Water Quantity Estimates for Proposed Fish Culture Facilities for Site One Reservoir

Facility	Estimated Quantity Required
Incubation/Rearing[1]	682 liters per minute (150 imp. gal./min.)
Brood Stock Holding[2]	682 ℓ/min (150 imp. gal./min.)
Total	1364 ℓ/min. or 300 imp. gal./min.

[1] Approximately 50,000 rainbow trout yearlings at 110/kg (50/lb) to be produced annually. If this production target (eg. reservoir stocking rate) is found to be inadequate relative to reservoir trout survival and fishery demands, the above specified water quantity would be inadequate to support larger numbers of similarly sized trout.

[2] At least 120 adult trout to be held on-site to provide fertilized eggs for incubation. The second comment in "1" is also appropriate to adult holding facilities.

Appendix I

Water Quality Standards for Trout Culture

Parameter	
Do	>6 mg/ℓ - (90% saturation)
pH	6.7 - 8.5
Alkalinity	20-200 mg/ℓ $CaCO_3$
CO_2	<2 mg/ℓ
Ca	>52 mg/ℓ
Zinc	<0.04 mg/ℓ @ pH 7.6
Cu	<0.002 mg/ℓ - soft water
Fe	<1.0 mg/ℓ preferably <0.3 mg/ℓ
Ammonia-N	<.05 mg/ℓ
Nitrite-N	<0.02 mg/ℓ
Nitrogen	<102% saturation
SS	<80 mg/ℓ
TDS	<800 mg/ℓ
Hydrogen Sulfide	<0.002 mg/ℓ
Cd	<0.001 mg/ℓ
Mercury	<0.0002 mg/ℓ
Temperature	4-17C, ideal 12C

Any detectable concentration of the following is of concern:

Residual chlorine
Phenolics
Cyanide
Surfactants
Pesticides
Oils
Sulfide

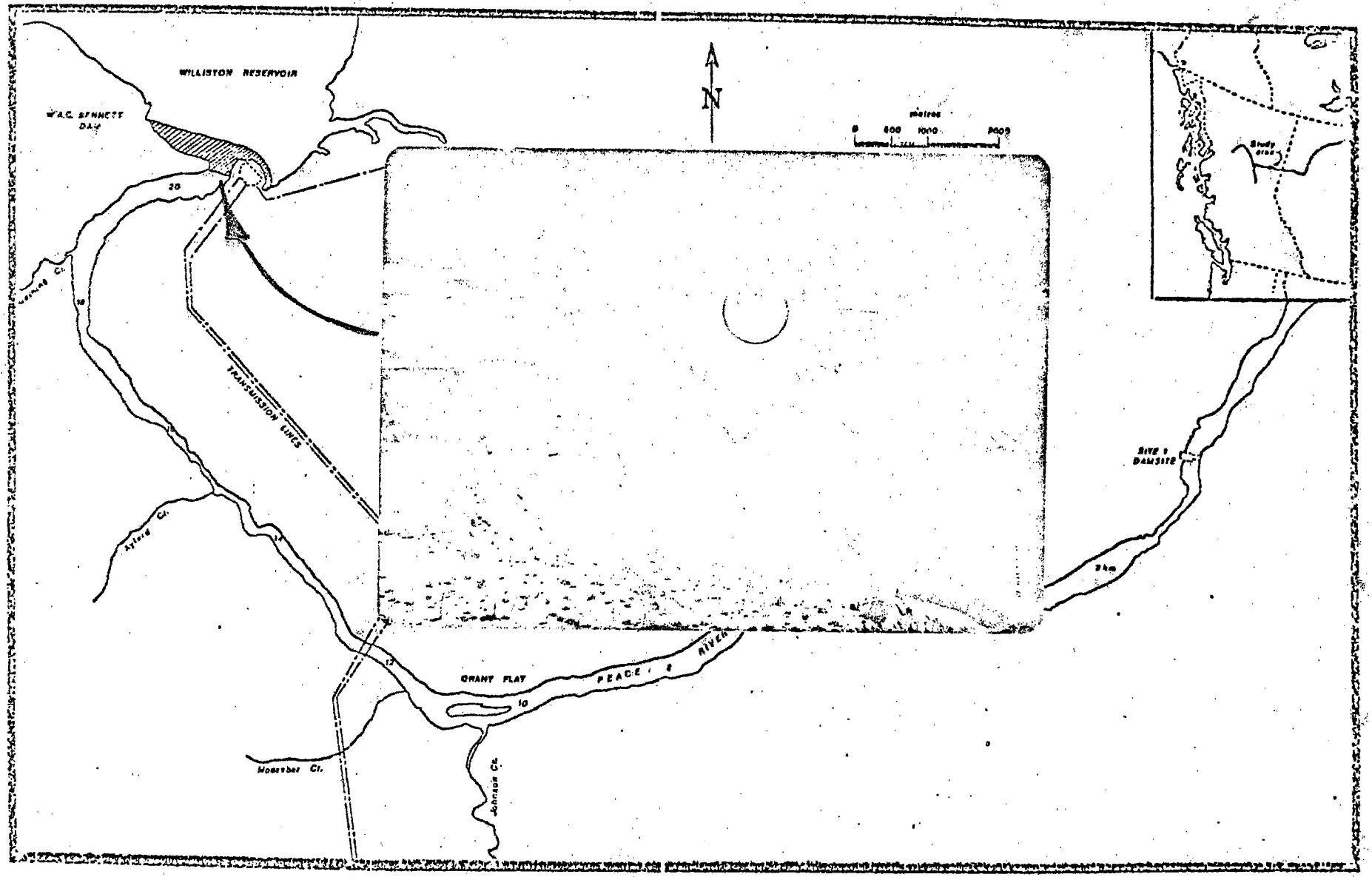
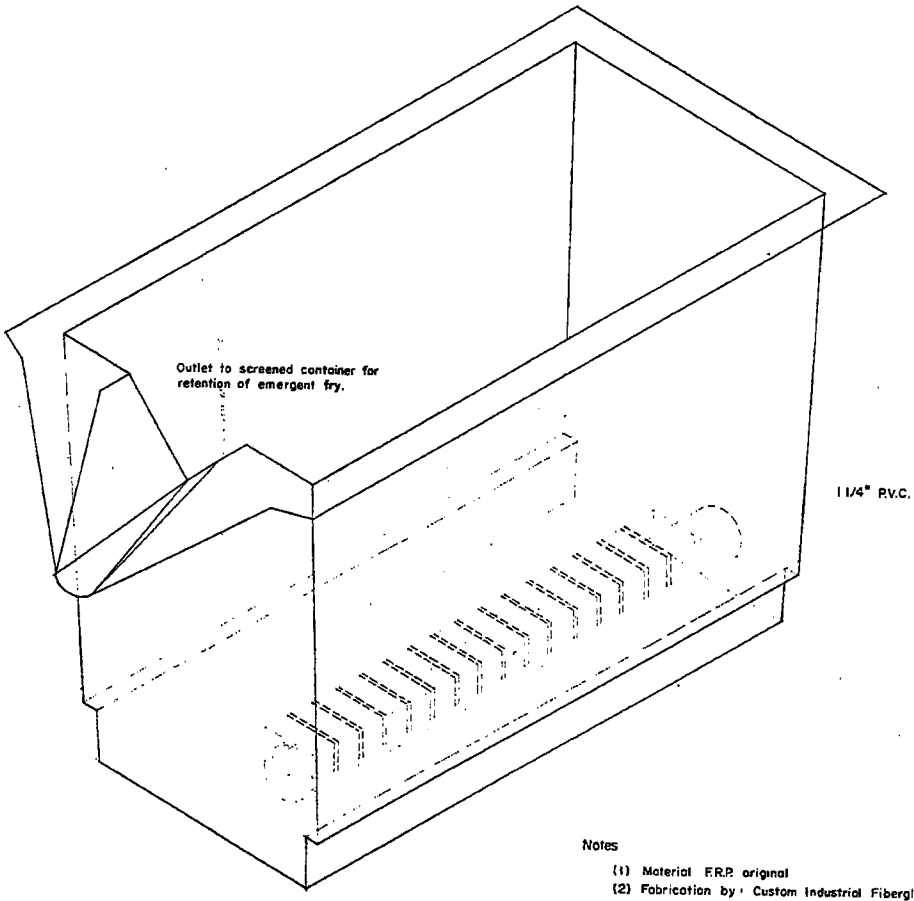


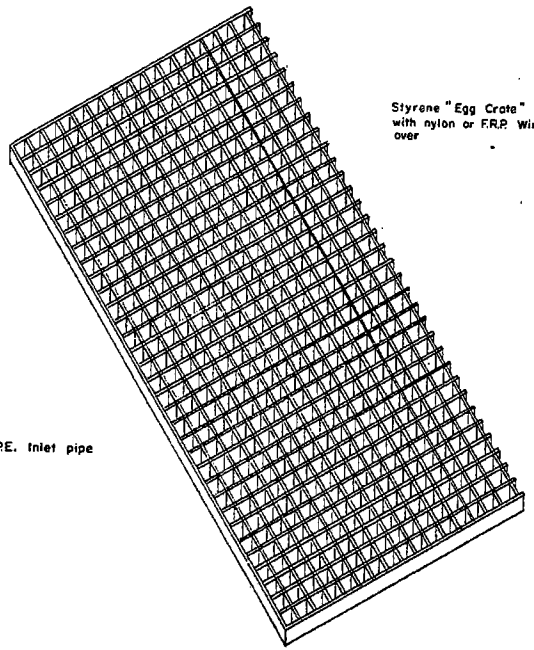
Figure 1. Site One study area. The proposed fish culture facility is to be tentatively located near the base of the W.A.C. Bennett Dam adjacent to the tailrace (see area circled on photograph).

1. Reduced to one-quarter of original size.

2. From Ash, G. 1976.

Appendix II Collection of site plans and construction details for trout incubation and rearing facilities at the Meadow Creek Spawning Channel.





Styrene "Egg Crate" 1/2" size, with nylon or F.R.P. Window Screen over

Notes

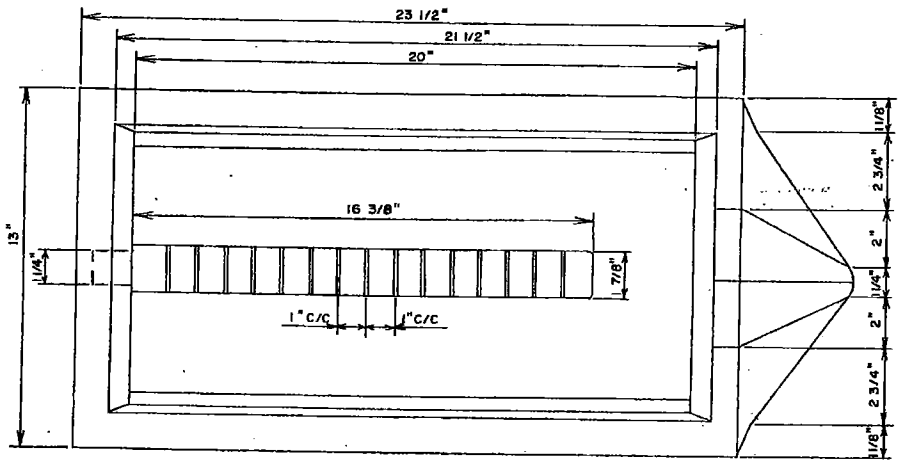
(1) Material F.R.P. original
(2) Fabrication by : Custom Industrial Fiberglass Ltd. Victoria B.C.
(3) Fill box with gravel to suit fish species involved

FISH AND WILDLIFE BRANCH
DEPARTMENT OF RECREATION AND CONSERVATION

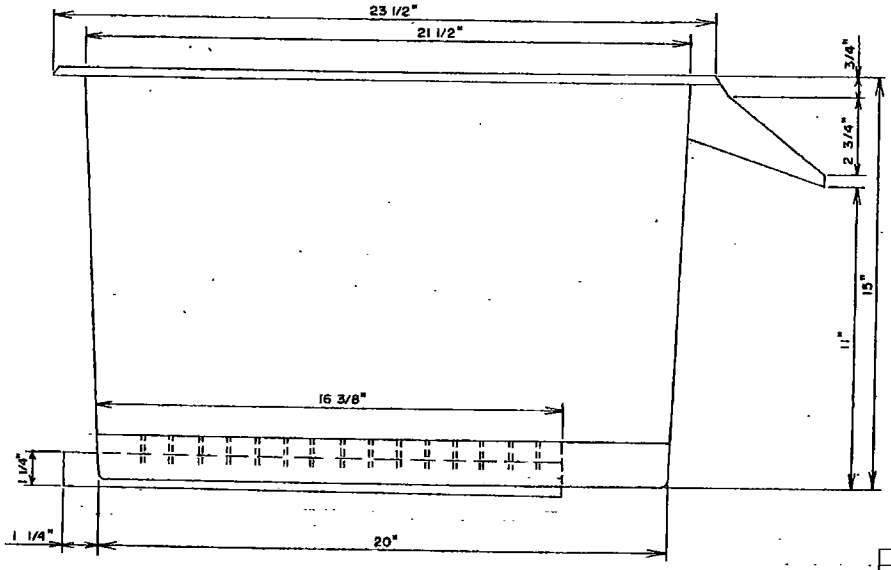
Tautz Box
Isometric Drawing

DATE:	DRAWN:	SCALE: 1"=3"
CALCULATIONS:	CHECK:	
APPROVED:		DWG. No. 2–2

200726



Plan View



Side View

Notes

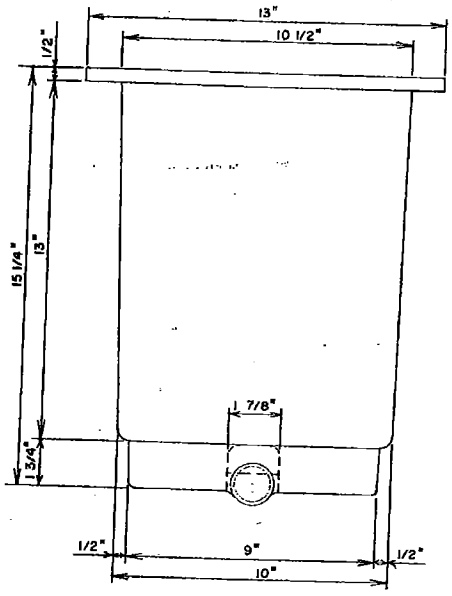
(1) Material F.R.P. original.
(2) Fabrication by : Custom Industrial Fiberglass Ltd. Victoria B.C.

FISH AND WILDLIFE BRANCH
DEPARTMENT OF RECREATION AND CONSERVATION

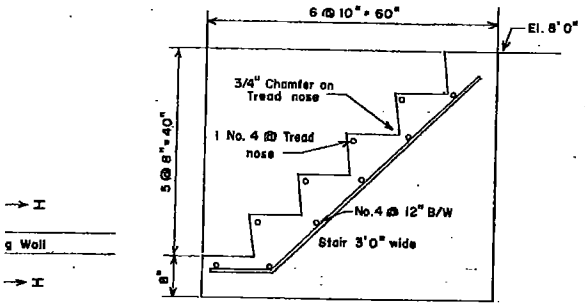
Tautz Box Incubation System

DATE: JUNE 13, 1975	DRAWN: K. BROWN	SCALE: 1"=3"
CALCULATIONS:	CHECK:	
APPROVED:		DWG. NO. 1-2

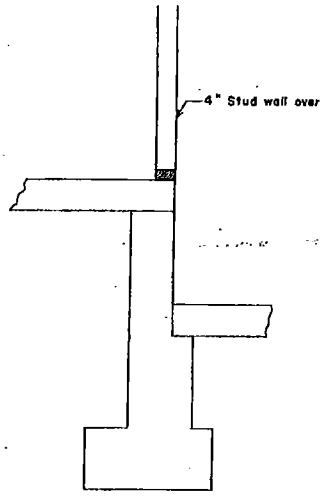
200725



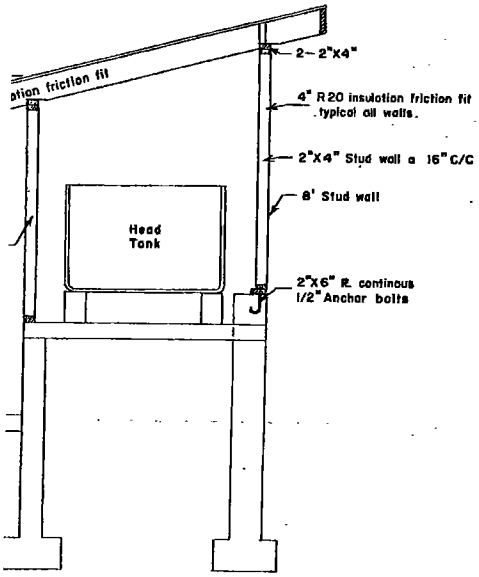
End View



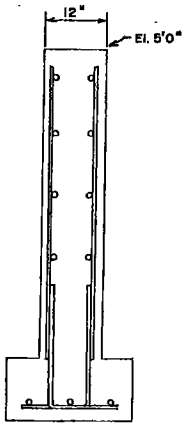
SECTION J—J
SCALE : 3/4" = 1'



SECTION G—G
SCALE : 3/4" = 1'



N B—B
3/8" = 1'



SECTION H—H
SCALE : 3/4" = 1'

Notes

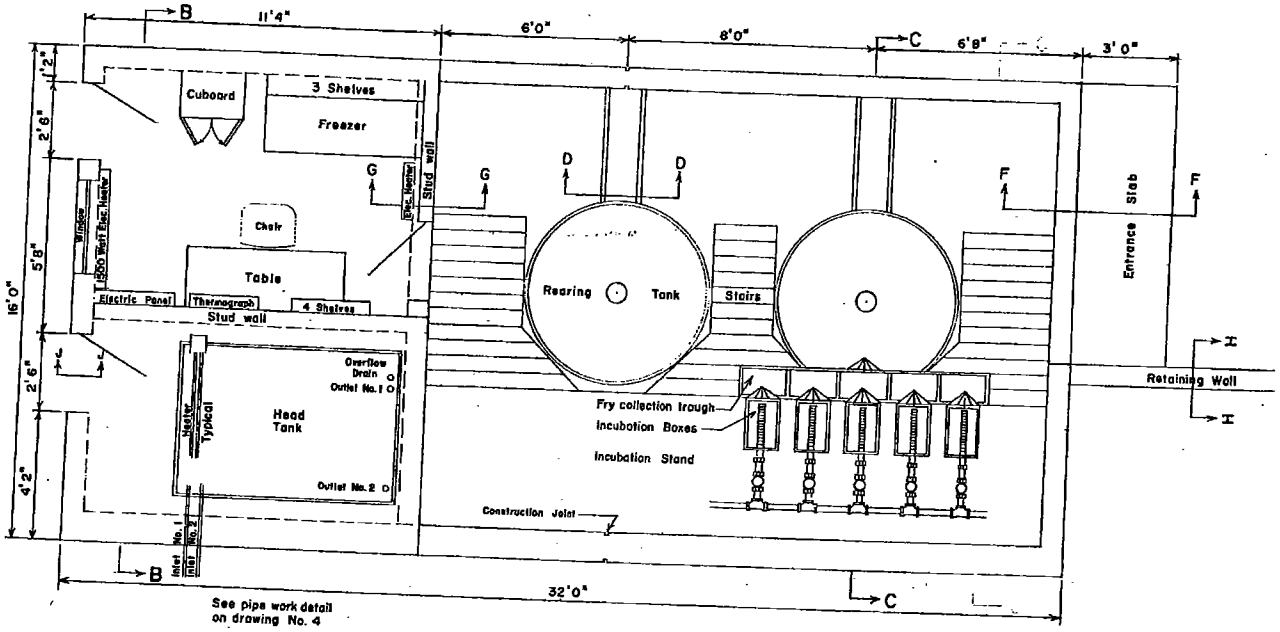
(1) See drawing No. 2 for concrete details and dimensions.
(2) Incubation box stand must be constructed to minimize vibration to eggs.
(3) Stand under egg incubation boxes to be timber or concrete.
(4) All stair and working platforms to be free standing and removable.
(5) Working platform and incubation platform height to be determined in the field.

FISH AND WILDLIFE BRANCH
DEPARTMENT OF RECREATION AND CONSERVATION

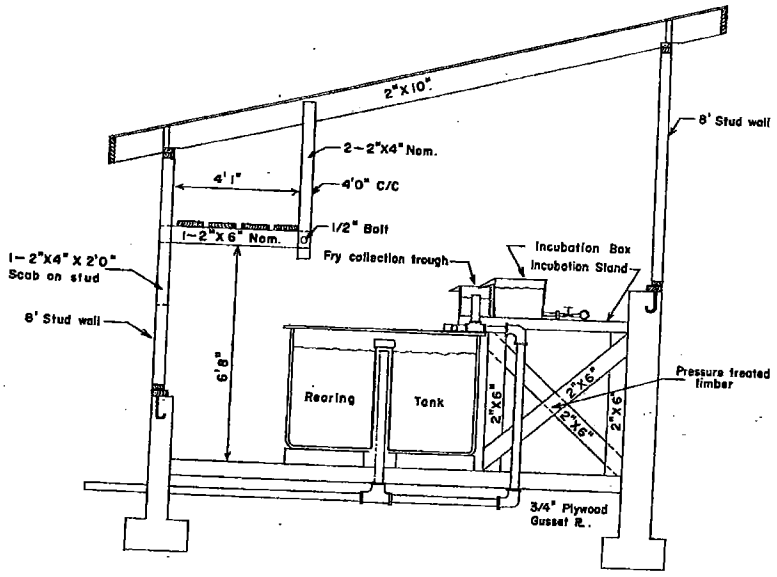
MEADOW CREEK
INCUBATION SYSTEM SITE PLAN

DATE: July 11, 1977	DRAWN: K. Brown	SCALE: As noted
CALCULATIONS: D. Hjorth	CHECK:	
APPROVED:		DWG. NO. 1—4

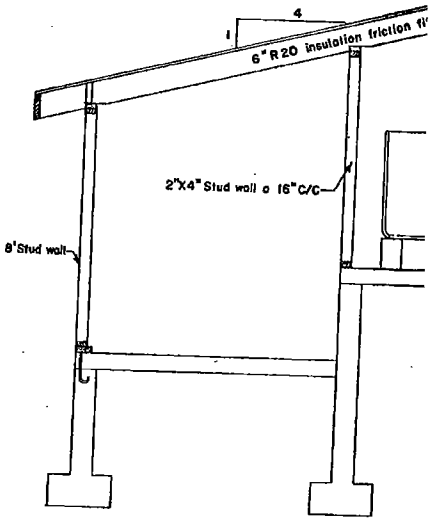
200753



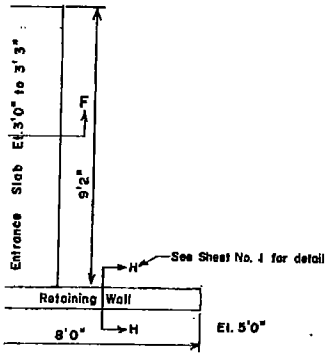
PLAN VIEW
SCALE : 3/8" = 1'

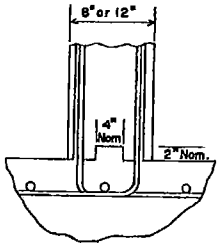


SECTION C—C
SCALE : 3/8" = 1'

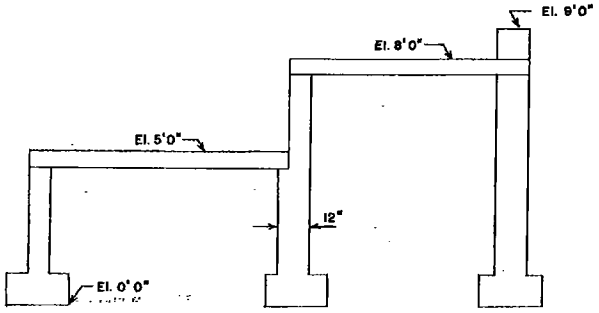


SECTION B—B
SCALE : 3/8" = 1'

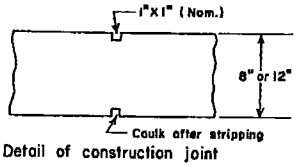




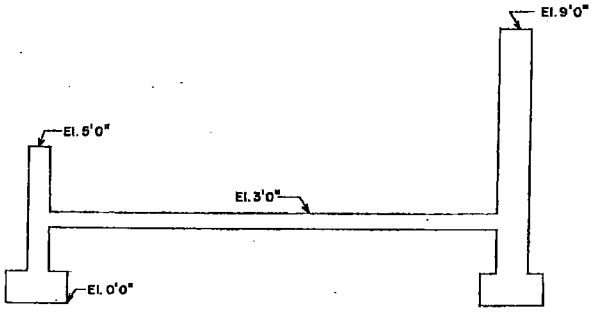
Wall to Footing Construction Joint
SCALE : 1" = 1'



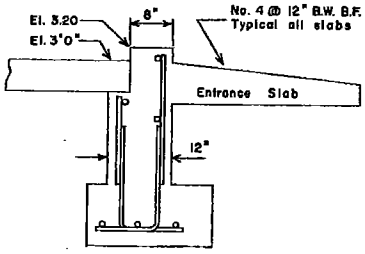
SECTION B—B
SCALE : 3/8" = 1'



Detail of construction joint
SCALE : 1" = 1'



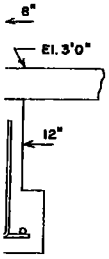
SECTION C—C
SCALE : 3/8" = 1'



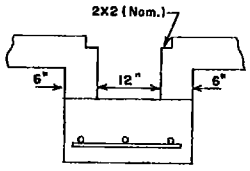
SECTION F—F
SCALE : 3/4" = 1'

Notes

(1) All forms to be inspected by the Engineer before placing concrete.
(2) Forms shall be made of dressed lumber of uniform thickness.
(3) Concrete shall have a minimum compressive strength of 3,000 pounds per square inch at 28 days.
(4) All reinforcing steel to be intermediate grade deformed.
(5) All reinforcing steel to have a 3/4" minimum cover of concrete except where noted.
(6) Dimensions to reinforcement are to outside of bars.
(7) Splices shall have a minimum lap of 40 bar diameters.
(8) Chamfer all exposed corners 3/4"
(9) All slabs to be 6" thick.
(10) All footings and slabs to be placed over 6" of compacted drain gravel.
(11) Backfill to road level



G—G
4" = 1'



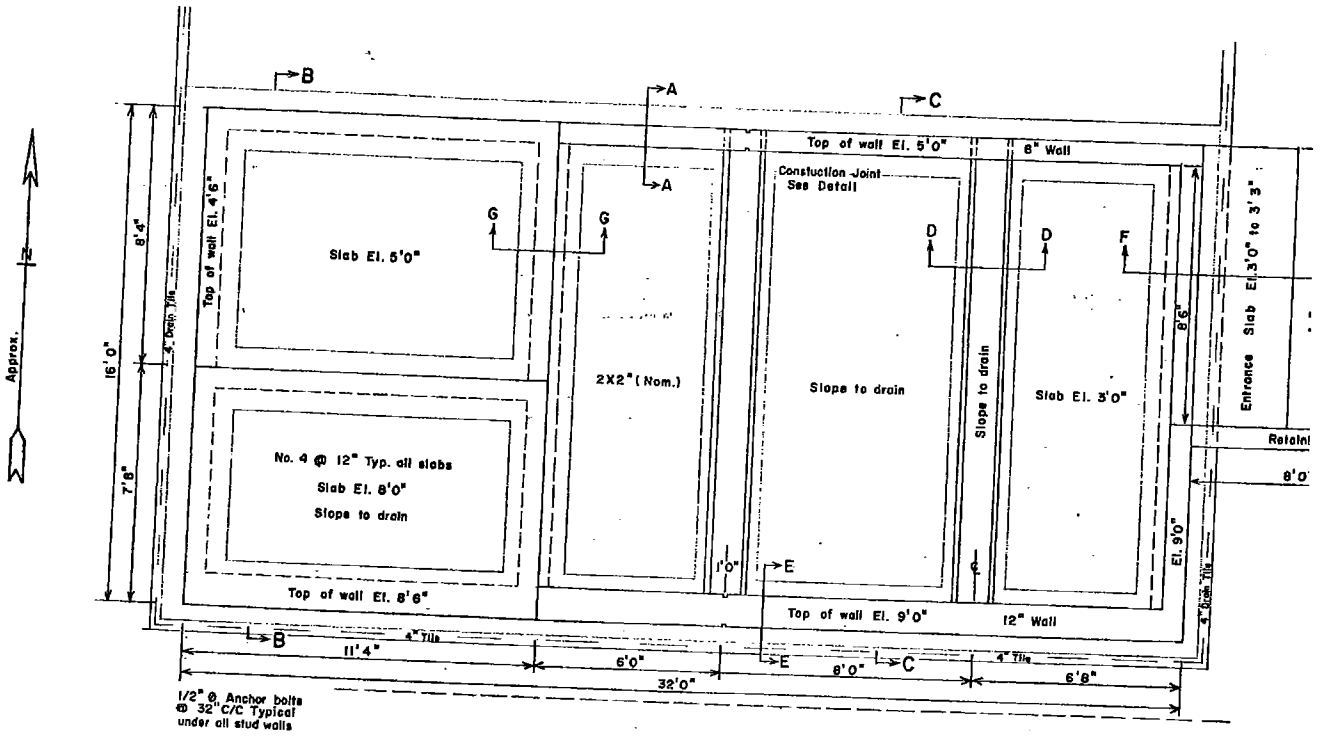
SECTION D—D
SCALE : 3/4" = 1'

FISH AND WILDLIFE BRANCH
DEPARTMENT OF RECREATION AND CONSERVATION

MEADOW CREEK
FOUNDATION PLAN AND CONCRETE DETAILS

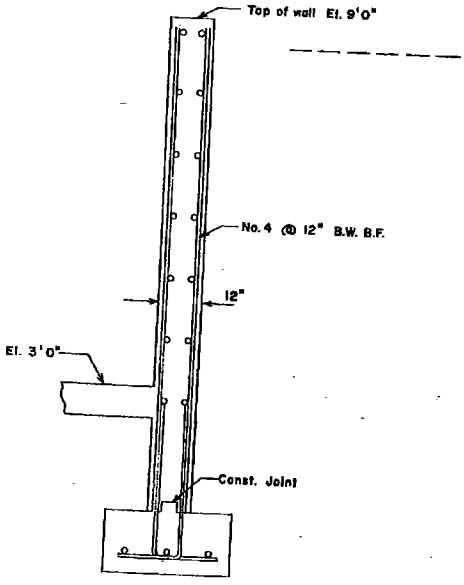
DATE: July 11, 1977	DRAWN: K. Brown	SCALE: As noted
CALCULATIONS: D. Hjorth	CHECK:	
APPROVED:		DWG. No. 2—4

200754



PLAN VIEW
SCALE : 3/8" = 1'

Existing Road
(Assumed to be 8.00' Approx.)



SECTION E—E
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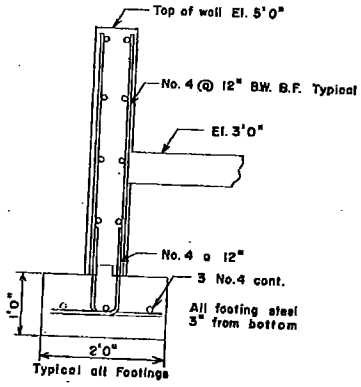
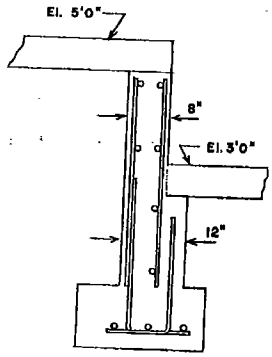


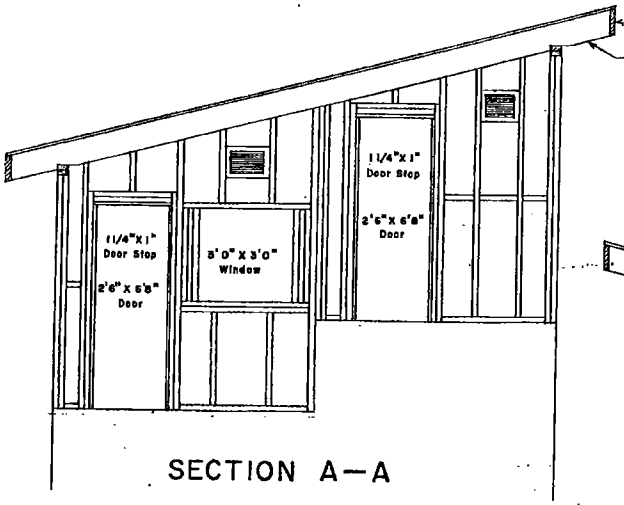
SECTION A—A
SCALE : 3/4" = 1'



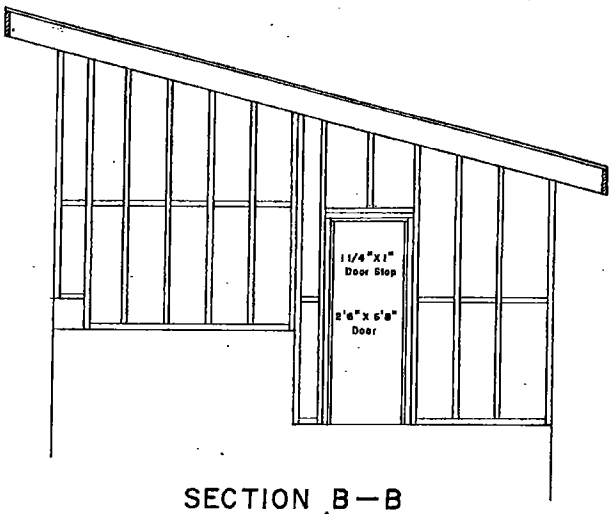
SECTION G—G
SCALE : 3/4" = 1'

ning Wall

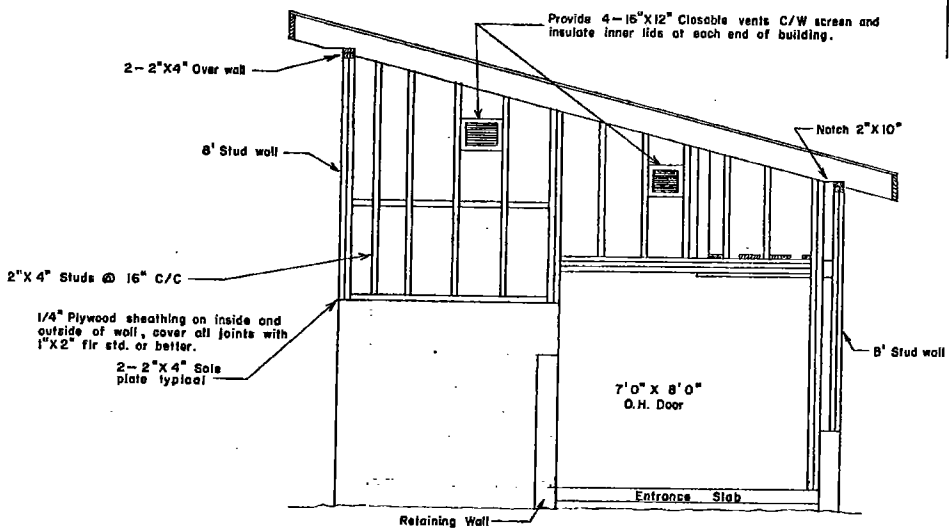
x10" roof joists @ 16"C/C



SECTION A—A



SECTION B—B



SECTION C—C

Notes.

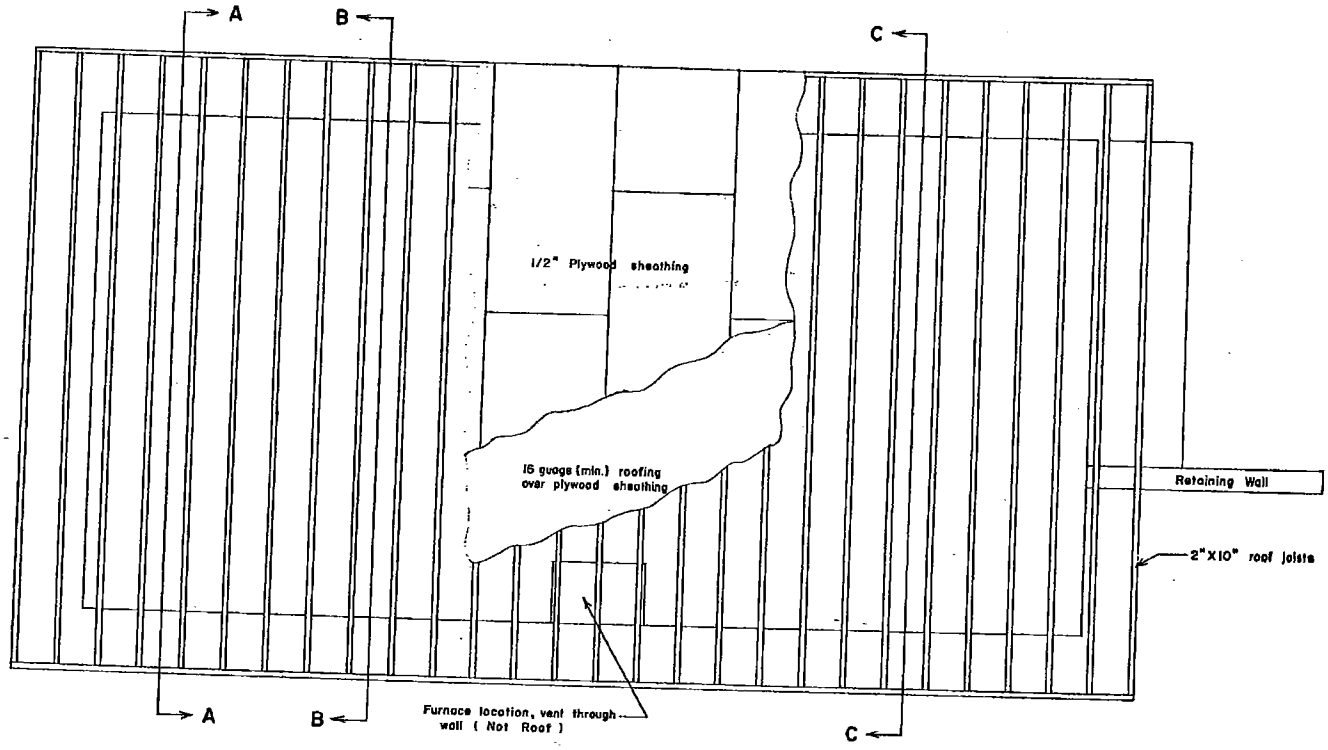
(1) 4" insulation R12 all over. wall.
(2) 6" insulation R20 all over ceiling.
(3) Double glazed windows with enameled aluminum frames.
(4) Provide a roof hung propane heater with blower, able to produce approx. 100,000 B.T.U. C/W, wall mounted thermostat.
(5) Provide stad. sheet metal overhead garage door (7'0"X8'0") and insulated.
(6) Paint inside and outside with one coat of undercoat and two coats of exterior, building white, trim forest green.
(7) All lumber to be std. grade or better.
(8) Doors to be solid core

FISH AND WILDLIFE BRANCH
DEPARTMENT OF RECREATION AND CONSERVATION

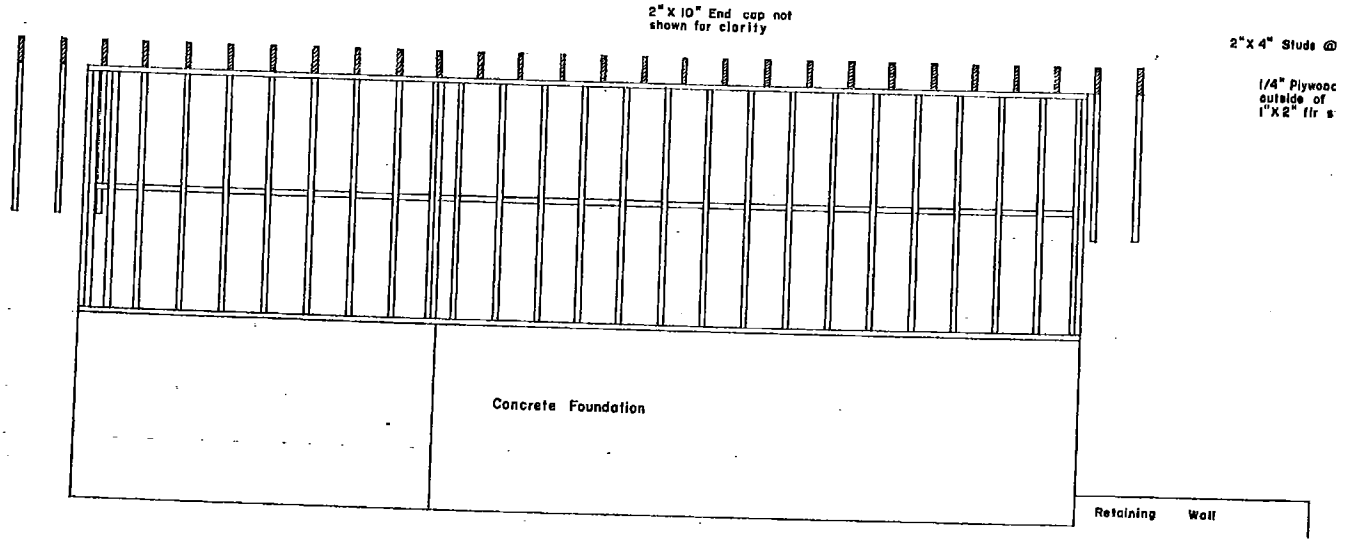
MEADOW CREEK
FRAMING DETAILS

DATE: July 11, 1977	DRAWN: K. Brown	SCALE: 3/8"= 1'
CALCULATIONS: D. Hjorth	CHECK:	
APPROVED:		DWG. NO. 3—4

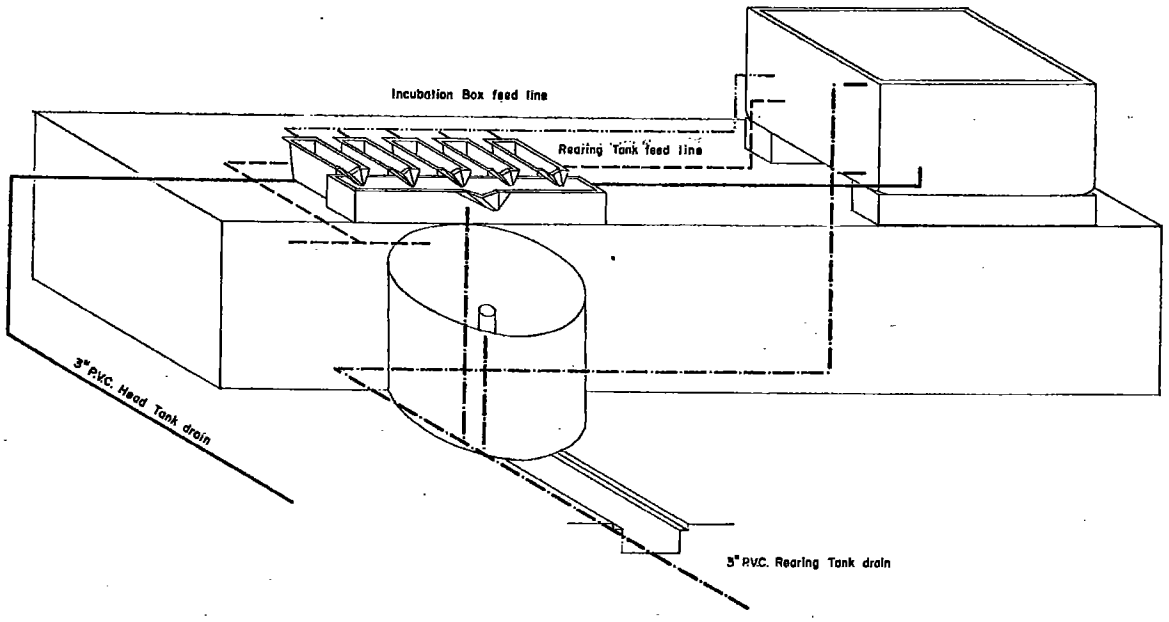
200755

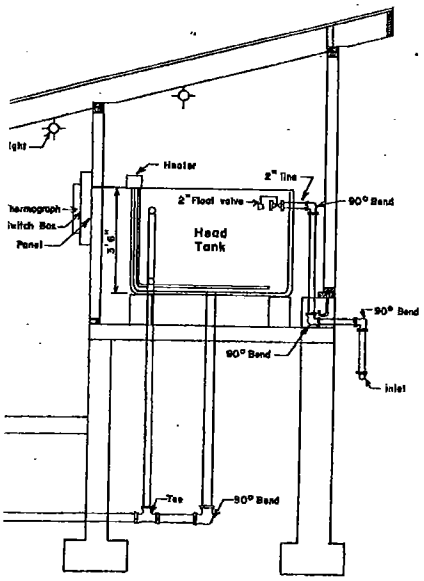


ROOF PLAN

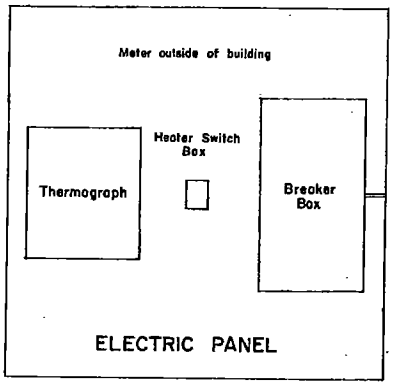


SIDE VIEW





CTION B—B
CALE : 3/8" = 1'



SCALE : 1" = 1'

Notes

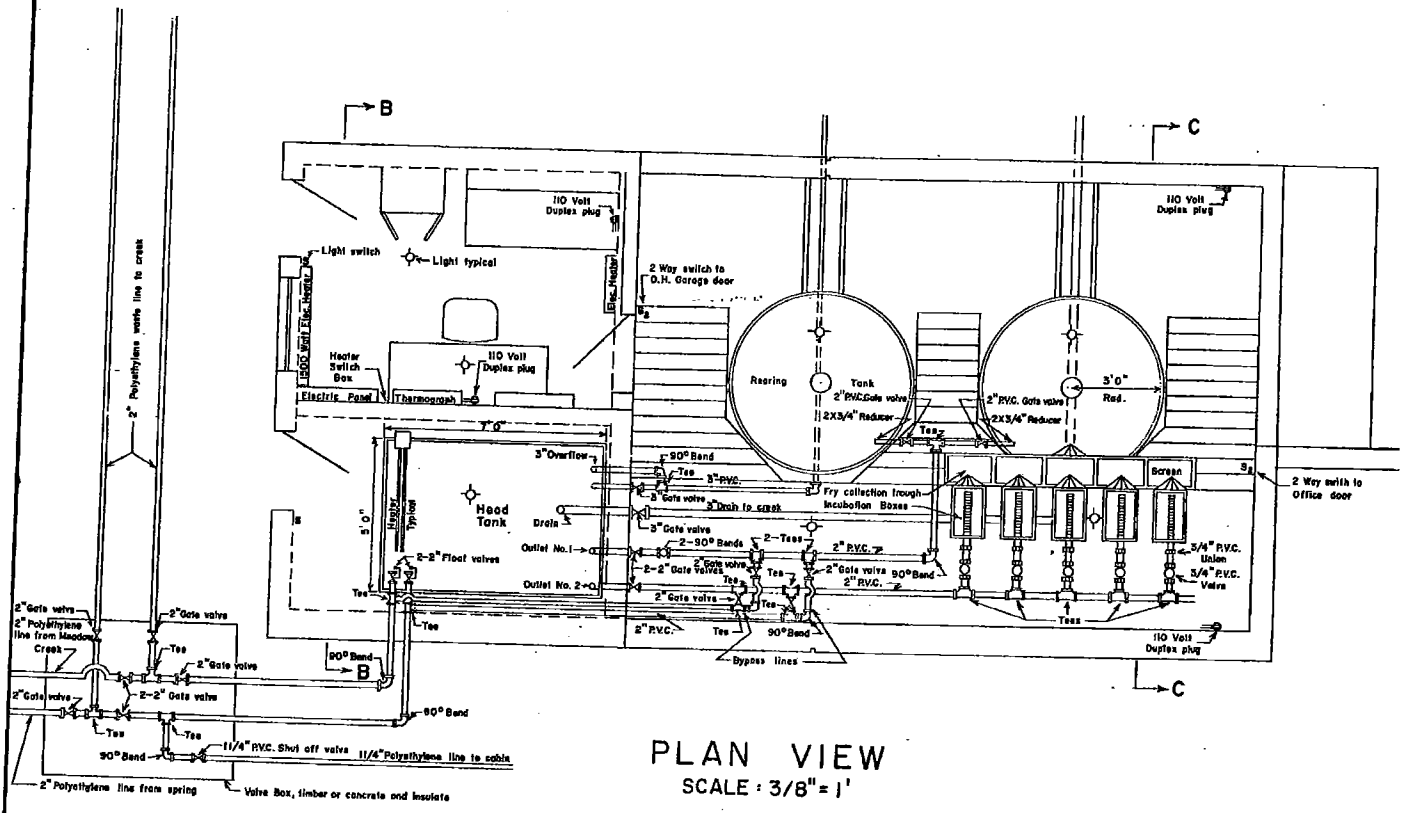
(1) Spring site must be improved by placement of sheet piling and a leaf protection roof.
(2) Fiberglass head tank, incubation boxes, collection troughs, rearing tanks and all pipe fittings are to be ordered as per other Fish and Wildlife drawings and specifications.
(3) Valve box and pipe work may be cast in concrete inside building if desired.
(4) All pipe work and fish culture facilities are to be installed under supervision by Fish and Wildlife Branch.
(5) All interior work such as stairs, tank stands and finishing is to be installed under supervision by Fish and Wildlife Branch.
(6) All electrical work to be done as required by local electrical inspector or local applicable C.S.A. Standard.

FISH AND WILDLIFE BRANCH
DEPARTMENT OF RECREATION AND CONSERVATION

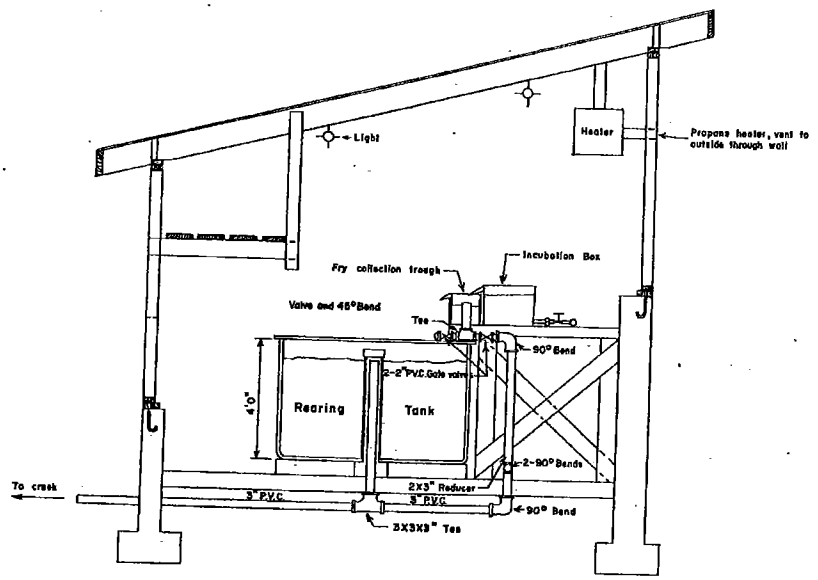
MEADOW CREEK
ELECTRICAL AND MECHANICAL DETAILS

DATE: July 27, 1977	DRAWN: K. Brown	SCALE: As noted
CALCULATIONS: D. Hjorth	CHECK:	
APPROVED:		DWG. No. 4—4

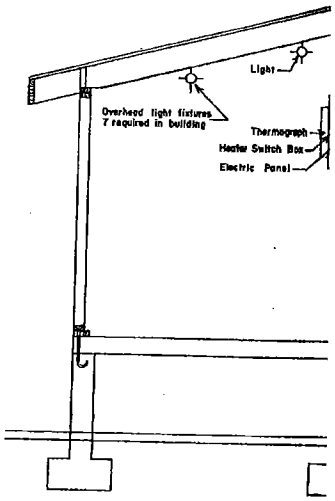
200756



PLAN VIEW
SCALE : 3/8" = 1'



SECTION C—C
SCALE : 3/8" = 1'



SECTION
SCALE : 3

Appendix III. Summary of estimated costs of proposed fish culture facilities for Site One Reservoir.

Item	Estimated Cost (1979)
a. Design, construction materials, water supply, fish culture and associated scientific equipment.[1]	120,000
b. Permanent and support (seasonal) staff annual salaries/benefits (eg. two permanent employees, plus two seasonal employees).[2]	51,000
c. Crew vehicles and major equipment requirements for brood stock capture and program evaluation (eg. boat/motor, nets, camping equipment, etc.).	38,000
TOTAL IN YEAR 1	209,000
d. Annual operating costs following Year 1 (salaries, equipment maintenance/replacement)	62,000

Total estimated cost (based on 1979 dollars) for a pilot operation = 209,000 + 6 (62,000) = 581,000

[1] Estimates do not anticipate all labour costs or freight delivery charges to the proposed site or Hudson Hope. Due to extreme winter weather conditions in the area, extraordinary design and construction material considerations may add significantly to costs outlined in "a."

[2] Staff salaries and benefits are in accordance with August 1, 1979, B.C. Government Employee Union rates for appropriate position levels associated with operation and evaluation of the proposed fish culture program.

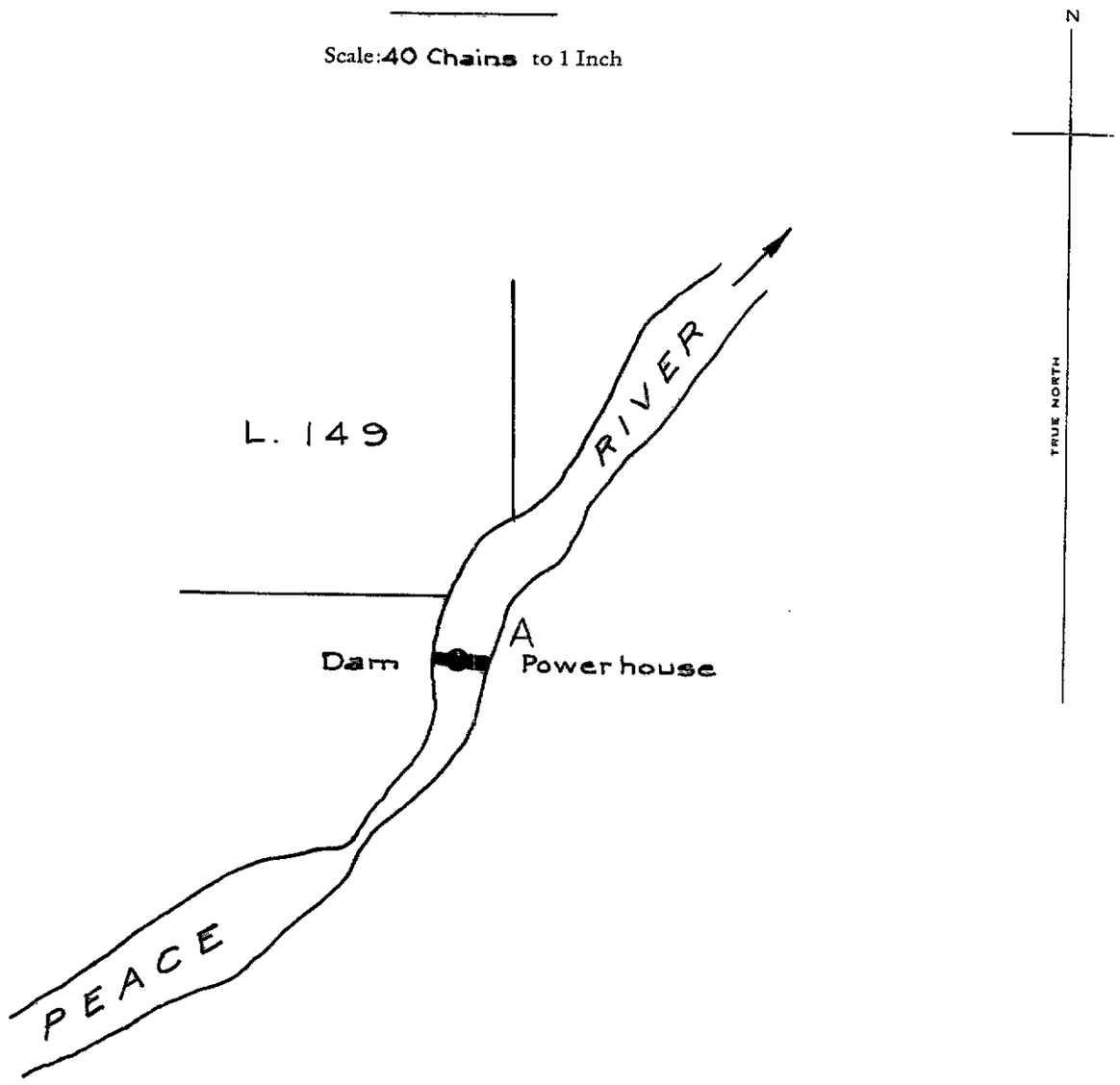
British Columbia

PRINCE GEORGE

~~PEACE RIVER~~ WATER DISTRICT

PEACE RIVER DISTRICT

Scale: 40 Chains to 1 Inch



LEGEND

Point of Diversion O

~~Ref.~~ Map ~~93 P/NW (P-1)~~ 93-P-091 (907944)

Signature [signature]

Date 25th Apr. 1974.

C.L. 42203
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PARSNIP PRECINCT

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12187
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