Tāłtān Tatl'ah Kimé

TAHLTAN I.R. 13 HOUSING

N.R.C.C.
A PATHWAY TO HEALTHY HOUSING
PROJECT REPORT
SPRING 2020

PREPARED FOR:

DAVID T.FORTIN ARCHITECT INC. &
NATIONAL RESEARCH COUNCIL OF CANADA:
A PATH TO HEALTHY HOUSING
ADVISORY BOARD REVIEW

OBSIDIAN
ARCHITECTURE LTD

PREPARED BY:
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TAHLTAN BAND

OBSIDIAN ARCHITECTURE LTD.

TAT L'AH KIMĒ

TAHLTAN HOUSING PROJECT
TATL'AH : I.R.13 RESERVE [DEASE LAKE, BC]

FINAL REPORT
04.15.20

NATIONAL RESEARCH COUNCIL OF CANADA
A PATHWAY TO HEALTHY HOUSING PROJECT
2019-2020

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FOR:
TAHLTAN BAND
& NRCC: A PATH TO HEALTHY HOUSING ADVISORY COMMITTEE
& DAVID T FORTIN ARCHITECT INC

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1 IMAGE 1: Swooping Ravens, Winter Snow-cap and Hanging Glaciers in Tahltan Territory
Photograph: Kelly Edzerza-Bapty

ACKNOWLEDGEMENT & DEDICATION

We would like to thank the community members that attended the meetings in Tlegohine/Telegraph Creek and Tatl'ah/Dease Lake, your perspectives and participation and support have helped inform this project in a very meaningful way. We appreciate your time and contributions. To the youth you came into the classroom and to the drawing boards with optimism and creative spirits, we thank you for sharing your curiosity and enthusiasm.
Tłani Maduh!

We would also like to thank the Tahtlan Band Chief, Council, Executive and Administration for supporting this project and research, we look forward to continuing to work with you on expanding this discussion and project, with the hopes to expand our housing stock significantly over the coming decade, and to use our own trees in the process. We hope that the contents of this report and the construction documents (drawings, budgets, and from this project are a valuable and useful tool to help provide applicable solutions to developing a new model of building that speaks to our knowledge of the land and the amazing resources that it provides us. The design and construction of: localized, cultural, energy efficient, and affordable housing and community buildings under our own capacity, by our own membership is a critical step in empowering our youth and young members to have both shelter and the skills sets and autonomy to contribute towards the re-vitalization and re-building of our collective communities. One of the key ways that the Indian Act has been successful is by disempowering our ability to build within our fulsome territories, and intervening on what we are 'permitted' to build on our lands. This work envisions building a future where we are sovereign and self-reliant, and no longer need intervention/permission/or funding from the Federal Government of Canada. May the forest of our Tāłtān knowledge replenish this fertile grounds that we call home.

We would also like to extend out appreciation to David T. Fortin Architect, and the NRCC A Pathway to Healthy Housing project for selecting our Tahltan community to conduct this research and project.

Tłani Māduh!

Kelly Edzerza-Bapty, Architect AIBC, NWTAA, MRAIC
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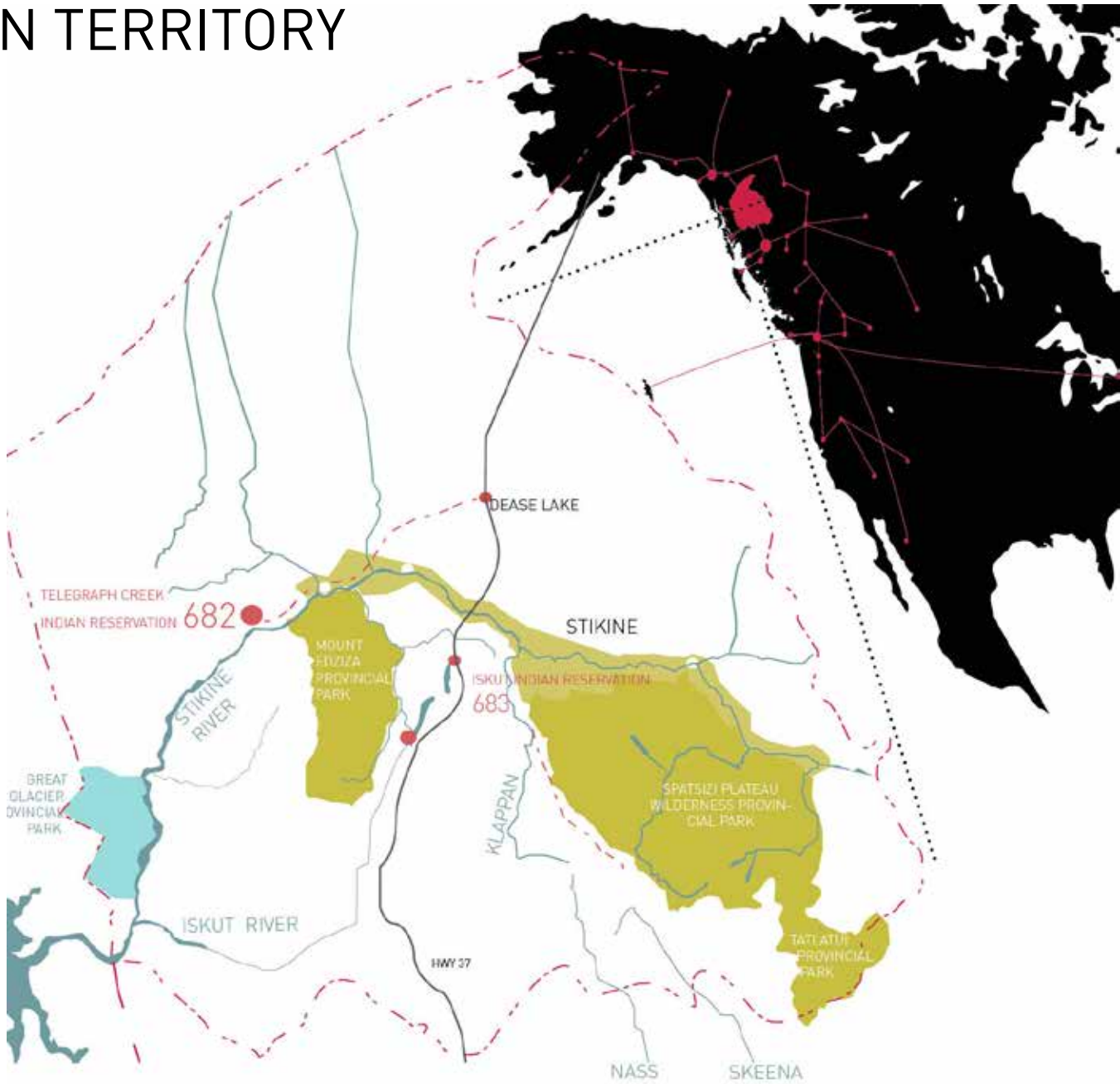
TAHLTAN TERRITORY



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LAND

The Tahltan Nation is located within the northwestern Corner of the land base of British Columbia. It encompasses the entire Stikine Watershed, and contains both pacific and arctic watershed headwaters. The Tahltan Territory contains 11.24% of Unceded Land Base within the Province of British Columbia and a small portion in the Yukon Territory. There are three modern service centres within the Tahltan Territory: Telegraph Creek, Dease Lake and Iskut. The Indian Act Bands within the Territory are the Tahltan Band, and the Iskut Band. The Tahltan Band has 13 Indian Reserves with a total of 1377 Ha of land spread throughout the territory.

IMAGE 3: Produced By Kelly Edzerza-Bapty, IMAGINE NATION: WITHOUT RESERVATIONS

The image is representative of the extent of distances of migration and travel for housing and employment for members of the Tahltan Nation, as well as the size of the Tahltan Territory represented within the North American land base.

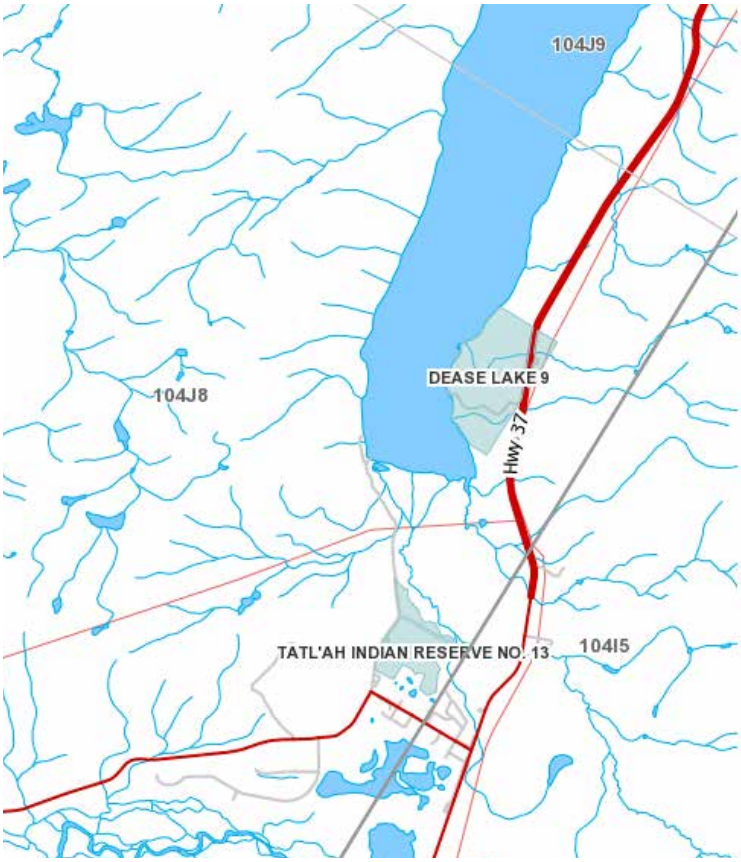
SUSTENANCE CULTURE

This region of Canada is know for its wildlife density. It encompases water splitting between the Pacific and Artic Watershed outflows. The upper plateau and Cassiar to Skeena to Coastal Boundary mountain ranges holds one of the densest intact predator prey ecosystems; and is home to some of the largest remaining caribou herds and migrations within the province of British Columbia. The Stikine River is a salmon migration and spawning grounds for five different salmon species that run the rivers every spring through fall. The moose , wolf, grzzly, mountain goat and stone sheep habitats are vast, and the Forests have remained intact to date, due to the remoteness of the region from satable timber markets. All of this is in a process of change, as the Province is pushing for fast paced and large scale mining and energy extraction through what is termed the golden triagle in the Northern Cordilerra.

The Tāłtān moved between summer fihsing camps and village sites along the Tu Dese Cho/Stikie River to catch and dry fish, up into the plateaus and caribou migration plateaus to live as caribou and salmon peoples.

Village sites stretch along the canyon walls at over 80 km of the length of the Tu Dese Cho/Stikie River to catch and dry fish in the summer, this was a prime location along the river as the Salmon migrated up the different rivers connecting to the Stikine, and the longer run would travel up to the confluence of the Tāłtān river. This site is the oldest village site and the heart and namesake of the Tāłtān Nation. Recent archaeological findings ucovered after the forest fires went through started to reveal the density and extent of habitation that once existed through this region. Given the abundance of wildlife, and the micro climates that existed throughout the region of the volcanic complex and hot springs, the pre-contact habitation of this region was vast. From the Glacier - ice patch archaeology study dones near Mt. EDziza Volanic Complex revealed both obsidian and Jade tools from below the glaciated areas, along with shells and obsidian micro-blades and different types of arrowheads and blades that have been carbon dated back over 10,000 years.

Today, Tāłtān are still largely sustenance based people, and still migrate into the Tu Dese Cho/Stikine River every summer to catch salmon and put it up for the year in the summer, and then hed out into the mountains to havest moose, caribou, sheep, bear, medicines and berries. The Tāłtān beardog was a key part of their hunting team, and hunting camps.



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IMAGES 4 : Locations of both Tahltan IR 9 & 13 in proximity to Dease Lake & Municipal Town, with hydrology mapping

DEASE LAKE REGION

The Tahltan Band has three reserves within closer proximity to the town of Dease Lake: IR9, IR13, and IR11. The newest IR13, is located in the community of Dease Lake, just north of the townsite, within close walking distance to the arena and school. Tatl'ah (IR 13) has yet to have any infrastructure development and will be a new energy efficient community and has high potential for a centralized district geothermal heating system. The Tatl'ah Kimé (Tahltan Housing: PILOT PROJECT) is focused on designing a new model of housing, that is easily adaptable and expandable to accommodate multiple types of building sites. and can be easily adjusted in plan to accommodate access and southern daylighting exposure.

CLIMATE DATA

The Tatl'ah IR 13 is located geographically within the height of land that splits between the Pacific and Artic Watershed. Located a few hundred meters from the southern tip of artic watershed at the South end of Dease Lake, and within a KM north of the Tanzilla River that feeds the Stikine River. The Stikine River is the main artery and lifeblood of the Tāłtān Nation. The Reserve climate is within a Zone 2-3, with average summer temperatures within the +18-23 degree Celsius range in the summertime, however it is not unusual to see heavy rain and even snowfall any month of the year, or to have short weather influxes into the mid +30 (though they are rare). The full summer season is short within the climate region, with the bulk of the summer season lasting June -mid-late August. In winter average temperatures range regularly in the -20s to -30s with occasional temperatures dropping into the low -40s without windchill factors. Dominant winds are northerly and would come in off of Dease Lake to the North. The Lakes and rivers will freeze over completely in winter time, and were a fast source of travel by dogsled to both Atlin and Daylu over frozen water passage. The region can get significant variations in precipitation levels, and the region is subject to snow drifting and ice-damming, especially during New Year Chinook weather systems. Winter light at the equinox has about 6-6.5 hours of daylight, with the summer solstice seeing nearly 22 hours of daylight.

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IMAGE 5 Dease Lake in mid Fall 2018
Photograph: Kelly Edzerza Bapty

EXISTING HOUSING

It has been nearly two decaseds since additional housing has been built as band assets on any of the Tahltan Reserves. Housing options on reserve are typical of 1970's & 80's packacge and modular housing builds provided by Indian Affairs at that time, that are far below the energy efficiency of even conventional housing standards. Many of the Houses were built with 2x4 and 2x6 construction wth fibreglass batt insulation and cellulose attick insulation. The air tightness and high heat looss due to thermal bridging attibutes largely to the high costs of heating the buildings. The buildings have not been designed to operate efficiently during the coldest winter months, and even simple standards like arctic entrace ways were not considered a part of the base housing design.

The housing shortage, high costs of utilities/hydro and overall high cost of living, have been a significat factor that has added significant duress and loss of community connection, by being forced by circumstance to have to move fromt he communities, dues to this shortage and unhealthy living conditions.

There is limited existing housing stock within the Dease Lake community to address seniors and accessible housing needs, and with young membership for opportunities for rental or ownership of smaller residences.

RE-BUILDING FROM THE FIRES

When forest fires burn they explode the pinecones and re-seed the forest that will grow in their place. It is the cycle of renewal. Similar to this cycle, we are in a process of Rebuilding our Communities, under our own vision, that is suitable to our specific cultural, geographic and climate needs. We are switching the narrative from the devastation that the forest fires and Colonial policy has brought to our lands and communities, and are embracing the opportunity to provide for ourselves as we have always done. Building from the vast resources and resourcefulness that we as a Nation have within the bounds of our British Columbia, and the Nation of Canada will support us in reciprocity. Tahltan Territory, as we choose to reconcile our relationship with the land, we are optimistically investing in our continuum as stewards.

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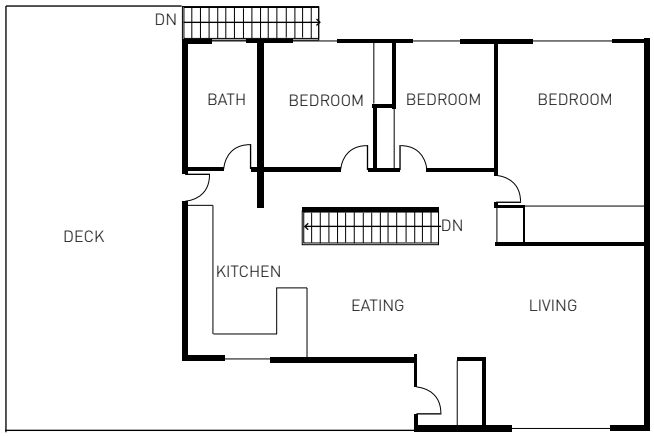
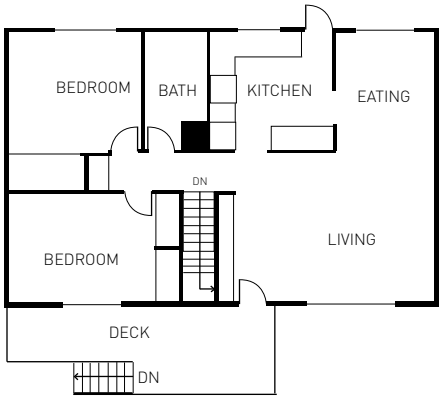
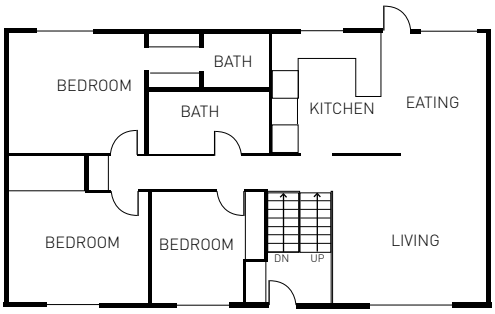
TYPICAL FLOOR PLANS OF EXISTING HOUSING







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A G U T H E T A H

EXISTING HOUSING TYPICAL ASSEMBLIES

EXTERIOR WALLS: R-16 to R-24 Effective Insulation Value Range
- 2x4 or 2x6 constrcution with fibreglass batt insulation
- 1/2" un-treated plywood sheathing
- gypsum wallboard finishing inside
- and either hardiboard or vinyl exterior siding

INTERIOR WALLS:
-2x4 walls with no sound insulation
-gypsum wall board finishes both sides

ROOF SYSTEMS: R-28-R30 Effective Insulation Value Range
- gable roof systems
- with firbreglass batt or clulose insulation at R22 value
-minimal ventilation has been provided in many of the roofs, with justsinple gable end vents
- several houses were lacking proper ventilation
- gable roofs have issues with heat bridging and convection with overheating in the summer time
- most houses have asphault shingle roofs

FOUNDATIONS
uninsulated concrete or wood foundations

INISHES
Windows are two to three pane vinyl or wood windows
siding is either stained wood, vinyl or hardi-plank
majority of roofs are asphalt shingles that require constant maintenance and replacement

interiors are all gypsum drywalled, and have either vinyl or carpeted flooring finishes

Basements were often left unfinished, and would sometimes have a bathroom roughed in or fully finished, some of the houses have secondary living spaces in the basement for additional family members.(house dependent)

SYSTEMS
Primary heat is electric or oil based Firced air, secondary heat with wood stoves or electric base board

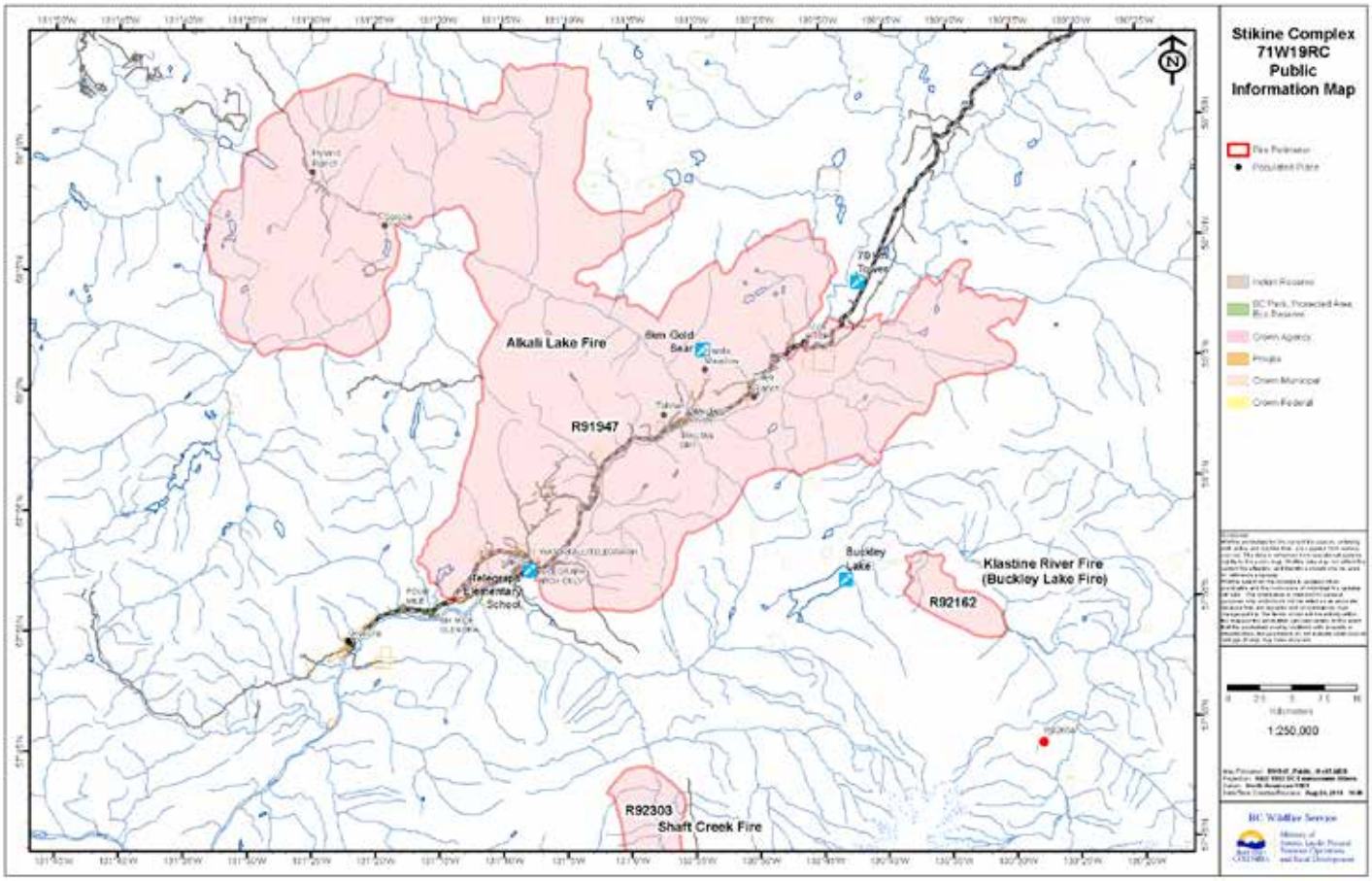
Individual water well and filtration (owner maintains filtration)

individual septic systems are dual chambered tanks with leeching fields (require pumping)

GRID
Electricity is provided from BC Hysdro Grid from district diesel power generation

ACCESS
Split level entry or second level entry, houses are not accessible or easily ramped to provide adaptable living options or age in place options

either wooden decks or concrete sidewalk in front of house community has gravel roads and no trails or sidewalk systems



FOREST FIRES | COMMUNITY LOSS AND REGENERATION

In the summer of 2018, the Tahltan - Stikine River Canyon had one of the provinces biggest forest fire complexes burn through its townsite. Community was evacuated from the townsite and area, as there is only one road in or the river out, smoke was dense, relative humidity was low, and the fires were burning hot and candling jumping back and forth across the river. Tahltan citizens and forest fire crews worked to save what they could, but the merging of three forest fire complexes in a drought year in the canyon burned out of control for the better part of August.

The Alkali lake fire complex merged three forest fires and burned a total of 191,000 Hectares in and around the Stikine River Canyon, through the community of Tlegohine/Telegraph Creek, and took 40 structures from the community. Houses that did not burn in the community had extreme smoke damage, and their septic systems had been damaged in trying to berm and brush around the houses in fire fighting efforts. There was significant work that would need to be done before community members could return home.

The community came together across the north to support the Tahltan people and communities, and have donated and volunteered towards the emergency efforts. Coming on the second year anniversary from the fires, and the community re-building and revitalization efforts are still underway for this remote community.

FOREST FIRE TIMBER SALVAGE

In many places the fire moved through hot and fast, running mostly through the ground cover and canopy, and only charring the outer bark of the trees, which makes them ideal for harvest. The trees that are either deadfall or still standing are effectively kiln dried timber. Unlike falling green wood, they no longer have sap running through their bark, and have lost most of their water weight, making them lighter to move.

Standing dried timber is viable salvageable for about 3 years after a forest fire, before root rot or wind effect causes radial checking that can damage the structure of the timber. The timber will be harvested in the winter time to allow an adequate 'cradle' of the dry wood to stop damage during falling, and to minimize impact on the trees that have been re-seeded from the fire.

The forest fire salvageable wood will be an ideal local product to re-build from, and I the process of harvesting trees left behind from the fires, we are actively helping regenerate the forest by helping to clear some of the dead trees making way for new growth, and also re-building from the destruction in our cycle of renewal as a community. Rebuilding ourselves from the fire.

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IMAGES: 13-16 Vacant lots where houses once stood, Fire destrcution 2018 Aguthe Tah Reserve, Telegraph Creek BC

IMAGE 17: Summer 2018 New Hosuing Replacing housing lost from forest fire

IMAGES 18-20: Existing Houses still standing after the 2018 Forest fires, Aguthe Tah Reserve, Telegraph Creek BC

Photos: Kelly Edzerza-Bapty, summer 2019

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FOREST FIRES:

Dryer winters, fast melting springs, drought and low relative humidity, and lightening storms are all climate effects that are increasingly creating prime conditions for the largest forest fires and fire complexes that we have seen within the Province of BC and as a global condition. The reality of mitigating the effects of forest fires on reural and remote first nations communities, is in part a part of our duty to public ssafety ,as Architects, we have the ability to advise and create effective solutions within both ground cover, maintenance plans, and building envelope, all factors that can mitigate the loss of structure due to rapid fire spread. These will be considerations that are taken into account throughout the project. We will engage the community members and frontline workers to help built out local solutions to deal with this emerging climate factor.

FOREST FIRE PREPAREDNESS

In 2017 and 2018 BC saw record fire years, with massive tracks of forrests going up in blaze in the Tsil'qot'in and Tahltan-Stikine regions. Increasing fire preparedness and fire-proofing from external rather than internal sources is of growing concern not only for life safety, but also for asset retention during evacuations. There are several factors within the design of a building that can increase the efficacy of a building envelope and environmental barriers. Forest fires when they are moving hot and fast spread through both ground cover and through spotting and candleing (when the fire sends sparks ahead that pre-ignite the canopy). Design wise, metal roofs perform much better that ashfault shingles and bitumen based roofing materials, additionally, the use of rockwool exterior insulation performs much better than eps or xps exterior insulations that have become common across the north as a part of the external thermal envelope.
For sidings, metal and concrete based siding products perform well for fire resistance, as does pre-fire treated wood which are far more economical and replaceable in remote communities that have longer shipping distances for urban produced constrcution materials.

12 IMAGE11 & 12: forest fire burn areas left behind from Alkali lake - Stikine firee complex from 2018

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IMAGE 7 -10: Progress photos of the log and timber framing of the Phillips Residence, Golden BC.

Image 7 shows the tagging sytems used by the timber builder when re-building the log and timber hybrid structure on site. The building is pre-built offsite, and then re-assembled on foundation at site.

Images 8,9 and 10 catalogue the re-assembly that took place over two days of site construction.

Image 6 shows the last roof section being crane lifted into place. The roof was strategically designed to be built in four sections to align with the timber purlins that would be exposed inside. The roof sections were thermally broken using sill gasket and enviro-seal to increase air tighness in the roof cavity, the roof sections were infilled with 2 lb sprayfoam from the underside, and the roof recived blueskin on the on theouter sheathing surface before strapping for the roof metal. This system was extremely efficient and saved a lot of ladder work and challenging frameing and overhanging work, had they been framed in place.

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BC WOOD & FOREST INDUSTRY BACKGROUNDER

In the mid 2000s the lumber industry in BC faced huge fall-out shadowing the housing crisis in the United States, and due to regulatory changes in the legislation to no longer require the logs to be milled within close range to where they were logged. Many mills shut down and the industry collapsed as raw logs were being shipped elsewhere throughout the province and out of country. The Pine beetle infestation was also setting in around that time, causing mass loss of harvestable timber and tree loss due to rot. Shaping up around this time were several niche markets for 'denim pine' and the technology of CLT and NLT (Cross Laminated Timber and Nailed Laminated Timber) were in their infancy in production in BC. In 2012 with the addition of 5&6 storey wood framed construction in the BCBC 2012 (BC Building Code), and the new government announcement to allow up to 12 storey structures of mass timber the wood industry is finally shifting into much higher value in products for the lumber industry in BC. The norther boreal region has exceptional wood in each the spf varieties, due to the short growth seasons, the growth rings on all species of trees are tight, offering high structural qualities as structural select timber.

The timber industry in BC, and specifically in the southern Kootenay and Shushwap regions, exports some of the worlds most sought after log and timber buildings. Timber and log building companies throughout the southern half of the province are producing extremely high value and high quality heavy timber housing and products predominantly to international markets.
These buildings are built to last hundreds of years, with minimal up-keep as long as the roofing systems cover all of the potential exposure areas, specifically the end grains of wood must be sealed to prevent 'straw effect', where the cellular strcuture of the wood draws moisture in through capillary action.

The Tatl'ah Kime projects seeks to employ this same mind set in using high value materials that are readily available in community

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HOUSING NEEDS DISCUSSION

During the different workshops in Telegraph Creek and Dease Lake we spent time discussing the different types of housing needs, the approach to construction, we looked at examples of log and timber framed construction, as well as discussed the construction capacities building aspects of building from our own logs, to build highly localized and energy efficient housing with a reduced carbon footprint and price tag. On remote builds, you can spend upwards of 50% of a budget on transportation between ordering in materials and people travelling to site from out of town. If you train in local capacity, you can keep a lot of that knowledge and economy in community, and you can offer capacity training in multiple construction fields and applications. The Idea of the Tāłtān Kimē project was to utilize local logs, milling and construction to build high value, energy and thermally efficient housing. And in doing so, we would be keeping funds that we are spending on the housing within the community, and also building in a higher capacity to be able to build other structures, such as, daycare and library spaces, cultural facilities, seniors housing, and cultural and government centres.

I would estimate that we have close to a 200 residence deficit within the Tahltan Nation Communities. With an estimation of existing housing stock and replacement and temporary housing in Telegraph Creek, I would anticipate that the housing need is around 80 residences in Telegraph Creek and 120 in Dease Lake. Until the forest fires, no new housing stock had been built on either reserve since the 1990s or earlier. The housing crisis is multi-generational, and homelessness can be observed at all generations. Homelessness can be classified in a broad spectrum, from overcrowding in households, where there are no other housing options or affordable options that allow members to move out of households. This sometimes is for multiple generations, and situations. Sometimes where children and grandchildren reside in their grandparents residences, or where grandparents have to move back in with their children as they age. Other examples where people 'float' from couch to couch with family, but do not have stable housing options of their own.

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USING LOCAL WOOD TO ITS FULLEST POTENTIAL

During the workshops a log and timber case study house was used to identify the opportunities and potential of timber, throughout the house. This Log and Timber hybrid project of ours, was a perfect model to walk through the discussion of use of local wood, milling, log and timber construction techniques and training. It showed what is possible with the use of log structure and options to modernize and optimize construction techniques and efficiencies.
This project uses both stacked log and timber framing with conventionally timber framed infill walls to create a highly breathable building. The logs expand and contract during the seasons, so key use of energy seal and chinking, and sill gaskets allow for this expansion and contraction without too much heat loss. The house is heated with ground sourced heat pumps as a primary heat source, with a wood fire place as a secondary source. The water system is site based well water and filtration and uv systems for filtration, with a dual chambered septic tank and field for sewage.

The house was built on site in two months to lock-up stage, with occupancy being achieved within 3 months. The foundation and slab were prepped on site, and the log and timber frame were craned into place in two days. The roof was pre-built on the ground on site, in four sections, then bolted together in place and fastened using GRK heavy timber screws into place.
The Insulation in the timber frame and int the roof are 2lb spray foam.
Along with the structure and exterior of the house being milled local Douglas fir and cedar, the interior wall cladding is rough sawn timber from the same logs as the timber, or are locally manufactured plywood or t&g Fir 2x6 or 1x6.
With no carpets or forced air systems inside the house, this house is hypo-allergenic, and extensively durable.
The owners of this house, were also the general contractors, and put extensive sweat equity into this build and the interior finishes, to allow them to leverage themselves into home equity and ownership.

TATL'AH KI ME

TAHLTAN HOUSING

HOUSING DESIGN WOKSHOP

THURSDAY

SEPTEMBER 19TH

TLEGOHINE

(TELEGRAPH CREEK)

4:00-8:00

AT THE REC CENTRE

FRIDAY

SEPTEMBER 20TH

TATL'AH

(DEASE LAKE)

4:00-8:00

AT THE SCHOOL DISTRICT BOARD ROOM

A PATHWAY TO HEALTHY HOUSING // A NATIONAL REASEARCH COUNCIL OF CANADA FUNDED PROJECT

This workshop will be the first of a series of design workshops held this fall and winter to discuss the housing needs for the new Tatl'ah Reserve (IR 13) in Dease Lake, and to start the conceptual design of some housing options.The results from the series of design workshops will be for Obsidian Architecture to prepare full construction drawings for a hosing project(s) this winter, and If funding is granted the projects will proceed into construction as a pilot project. Please come and participate and help inform and guide thisproject and the resulting designs.

FOR MORE INFORMATION CONTACT:

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COMMUNITY WORKSHOPS SUMMARY

WORKSHOP 1:

- BUILDING FROM OUR OWN LOGS
- FOREST FIRE TIMBER SALVAGE
- GEOTHERMAL HEATING
- SINGLE LEVEL - SMALLER HOUSING
- NOT TINY-HOUSES
- FLEXIBLE HOUSING
- SENIORS HOUSING
- PERHAPS SENIORS AND YOUNG FAMILY HOUSING
- FAMILY SUPPORTED SENIORS HOUSING (INDEPENDENT LIVING UNITS)
- SWEAT EQUITY - AND HOME OWNERSHIP
- EQUITY AND OWNERSHIP
- HOMELESSNESS

HOUSING STRATEGY DISCUSSIONS

- USING OUR OWN CULTURAL MODELS AS A BASIS FOR DESIGN
- LEARNING FROM OUR FAMILY CAMPS (HUNTING & FISHING)

WORKSHOP 2:

DESIGN REVIEW

- BUILDING FROM OUR OWN LOGS
- FOREST FIRE TIMBER SALVAGE
- GEOTHERMAL HEATING

CHILDREN ARE THE HEART OF OUR COMMUNITIES

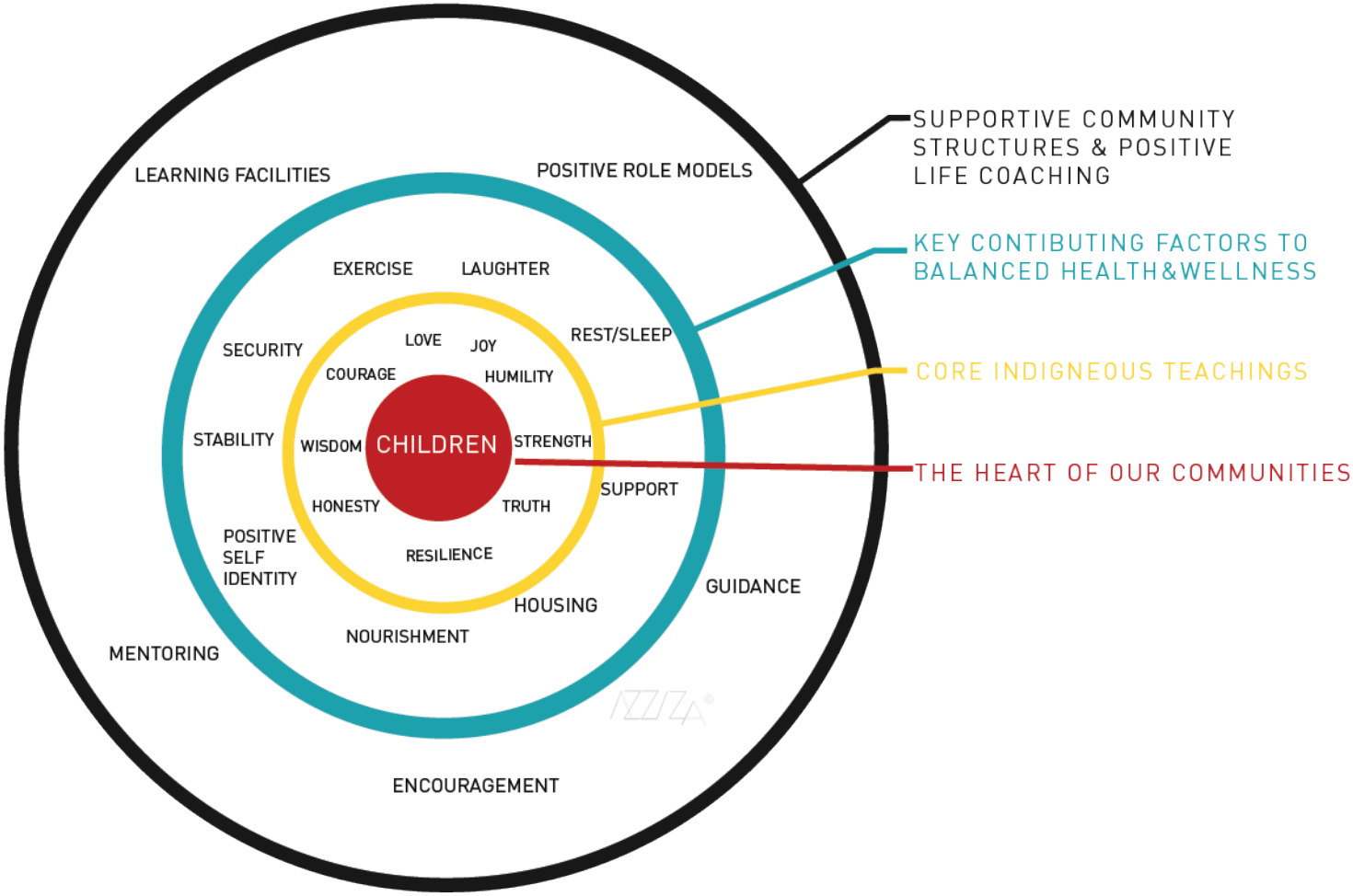

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IMAGE: 25 Child Centered Design Methodology Diagram, OBSIDIAN ARCHITECTURE LTD.©2019
The diagram is representative of the concept of "Child at the Centre", the concept of the child at the centre (or child on the blanket) is a demonstration that I have seen presented in several ways by many socio-cultural working groups throughout the north. I first saw it presented by Gwitchen Member Louise Creyke after the Tahltan Central Council's AGA in July of 2013 or 2014 I believe as a part of the Stikine Wholistic Working Group

IMAGES: 26 & 28,
Telegraph Creek School Youth Workshops 2019
Photos: Kelly Edzerza-Bapty,

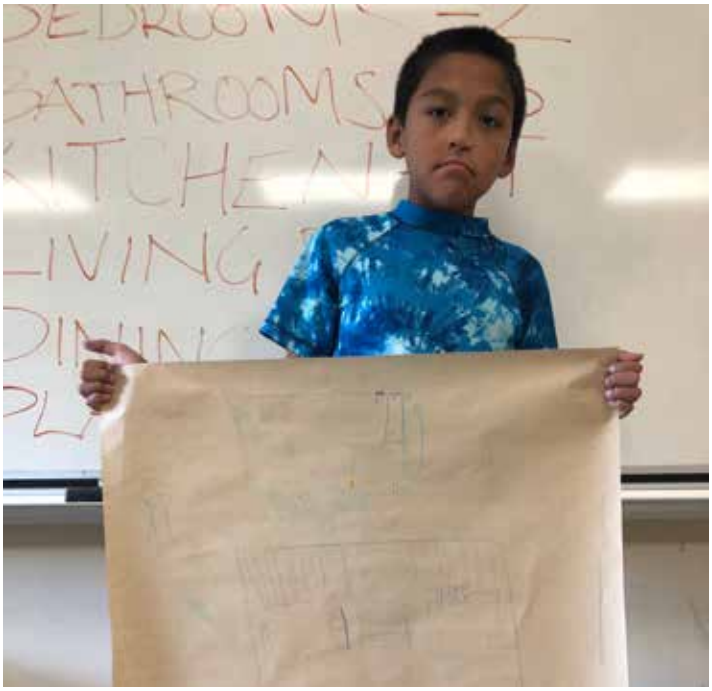
CHILDREN ARE THE HEART OF OUR COMMUNITY

Obsidian Architecture Ltd is developing the concept of Child Centered, walkable community structure, wherein the child is the centering factor as the heart of the community, and all other community structures form around the child. This ethos will form part of the methodology for the community workshops, by forming out a full day of youth programming with youth at the Schools in Dease Lake and Telegraph Creek, during each meeting set. This will also be to utiltise this reserach project as a teaching and mentoring opportunity while the consultants are in the Tahltan Territory, and will further benefit the connection and participation from communty members to the project and initiative.

The diagram is representative of the concept of "Child at the Centre", the concept of the child at the centre (or child on the blanket) is a demonstration that I have seen presented in several ways by many socio-cultural working groups throughout the north. I first saw it presented by Gwitchen Member Louise Creyke after the Tahltan Central Council's AGA in July of 2013 or 2014 I believe as a part of the Stikine Wholistic Working Group. Kelly Edzerza-Bapty, has been a youth advocate for many decades, coaching, mentoring and encouraging youth through many aspects of school, sport, positive self representation and education. We bring this social lens into our practice an as a foundational belief, we belive that we are a product of our environment, which includes teh physical and metaphysical, having housing that is supportive and reflective of our Tahltan ways of living with the land and seasons is an important part of positive self identity, as well as providing both safe, healthy and affordable housing for all of our members.

Youth workshops were conducted within both the Telegraph Creek and Dease Lake schools during the community workshop session in September, as a means to use this project as a teaching and engagement tool with the youth. Kids were enthusiatic, and inventive, and their insigts into building, and questions about architecture helped to form this project in wonderful ways.

We did not get to retun to communtiy this spring due to covid 19 travel restrictions, however we plan to carry out our second workshop series, doing a timber framing and wall mock up model with the highschool kids in Dease Lake in the fall, as a part of our pilot project.



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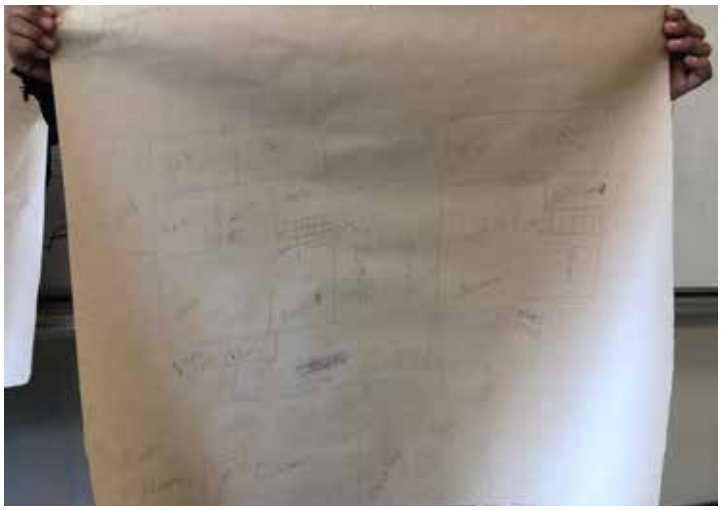
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S . M . L . XL

CULTURAL MODEL HOUSING

The day following the youth workshop and the community evening workshop in Dease lake was followed by a visit out to one of the youth cultural camps located up off the Tanzilla River southeast of Dease Lake. The camp is currently in process of teaching youth how to build and survive on the land, through a serves of youth camp outs, where they are working with mentors building a double- lean-too structure

DOUBLE LEAN-TOO TIMBER FRAMED HOUSE DESIGNS
TĀŁTĀN KIMĒ (TAHLTAN HOUSE)

Utilizing the Tāłtān Kimē framing structure and floor plan as a central guiding concept for the project design, as well as full log concepts for building a healthy house appropriate for Tahltan Climates. The traditional housing for the Tahltan was built as a double lean-too house, or shed roofed houses that were built out of solid vertical logs, with bark, clay and moss roofs and chinking, I have also heard of slate style stone used on roofs. The double lean-too roof, served the purpose of sheltering the full interior space, while also allowing the interior fire to vent the smoke from inside. Logs were easily tooled and placed on end to allow their easy repair and replacement; it also serves as a useful structural application in contemporary structures in this application.

TIMBER FRAME STANDARDIZATION

The timber framing for the units have been standardized on a 12' grid, with a double lean-too staggered roof pitch or a single shed roof pitch to allow ease of buildability in the structural frame, while allowing flexibility of the interior floor plan layouts. The wall systems have been designed to a highly thermally efficient double wall system, that stacks on top of a ICF form at 11.25", which allows an ideal wall build-up double 2x4 wall systems:

PLAN LAYOUTS:

S	SMALL	12x24 UNIT
M	MEDIUM	24x24 UNIT
L	LARGE	36x24 UNIT
XL	EXTRA LARGE	48x24 UNIT

FLEXIBLE HOUSING DESIGNS

Designed from a standardized framing structure, allows the buildings to be expandable in either direction simply by adding more framing models, which would allow a building to grow or partition into separate living spaces as needed. Units have been categorized into several sizes ranging from studio to five bedroom units, with the idea of expandable framing structures.

Units have been designed to meet the housing needs across a broad spectrum.

S | SMALL

16x24 UNIT
TWO STOREY
CENTRAL LIVING SPACE
PILE FOUNDATION

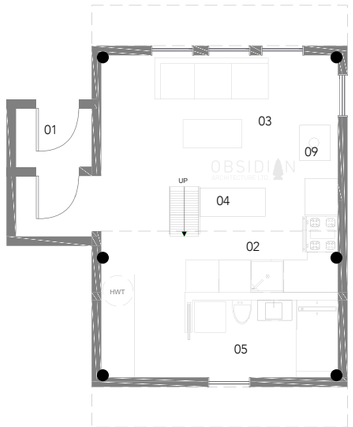
M | MEDIUM

24x24 UNIT
TWO STOREY
TWO BEDROOM + DEN
ACCESSIBLE MAIN FLOOR
CRAWL SPACE

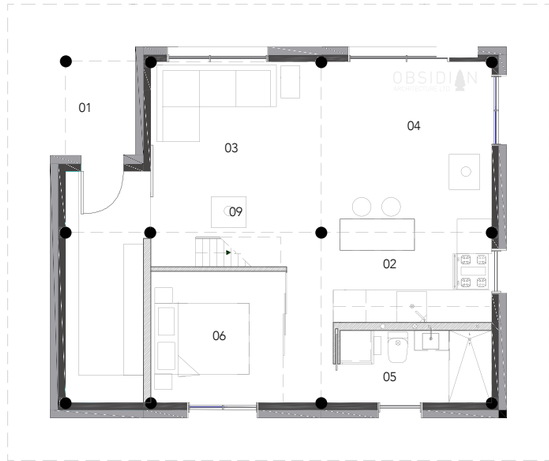
L | LARGE

36x24 UNIT
TWO STOREY
BASEMENT OPTIONAL
FOUR BEDROOM + DEN
ACCESSIBLE MAIN FLOOR

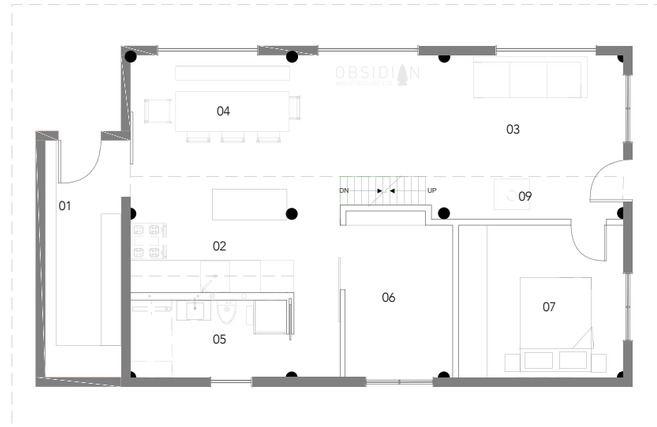
01 ARTIC ENTRANCE
02 KITCHEN
03 LIVING AREA
04 DINING
05 BATHROOM
06 FLEX ROOM
07 BEDROOM
08 SMALL BEDROOM
09 WOOD STOVES



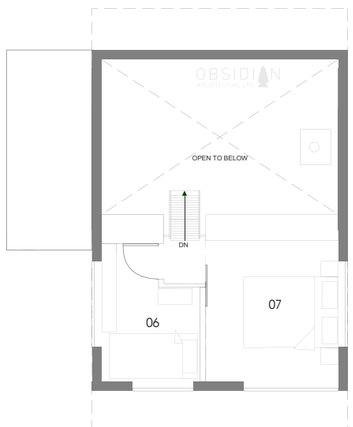
MAIN FLOOR PLAN | SMALL



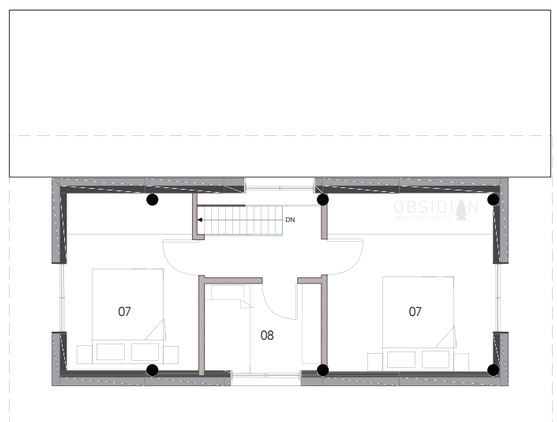
MAIN FLOOR PLAN | MEDIUM



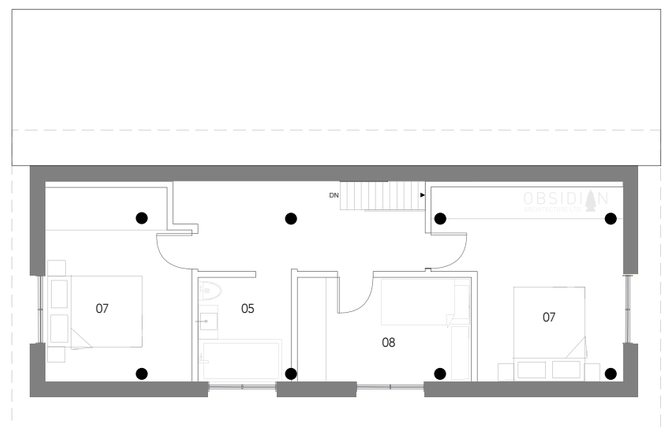
MAIN FLOOR PLAN | LARGE



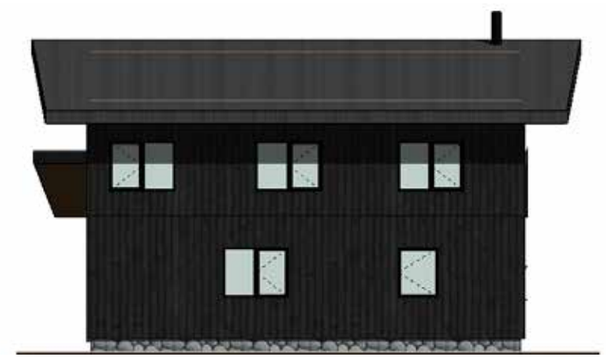
SECOND FLOOR PLAN | SMALL

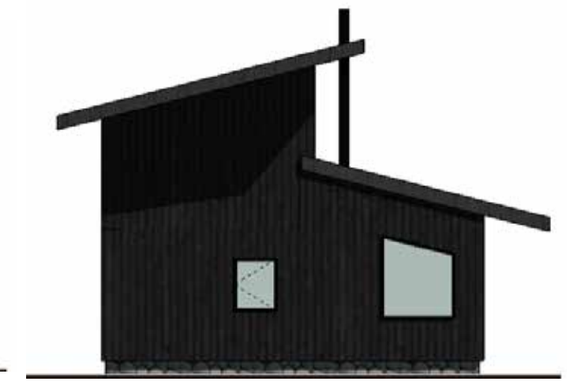


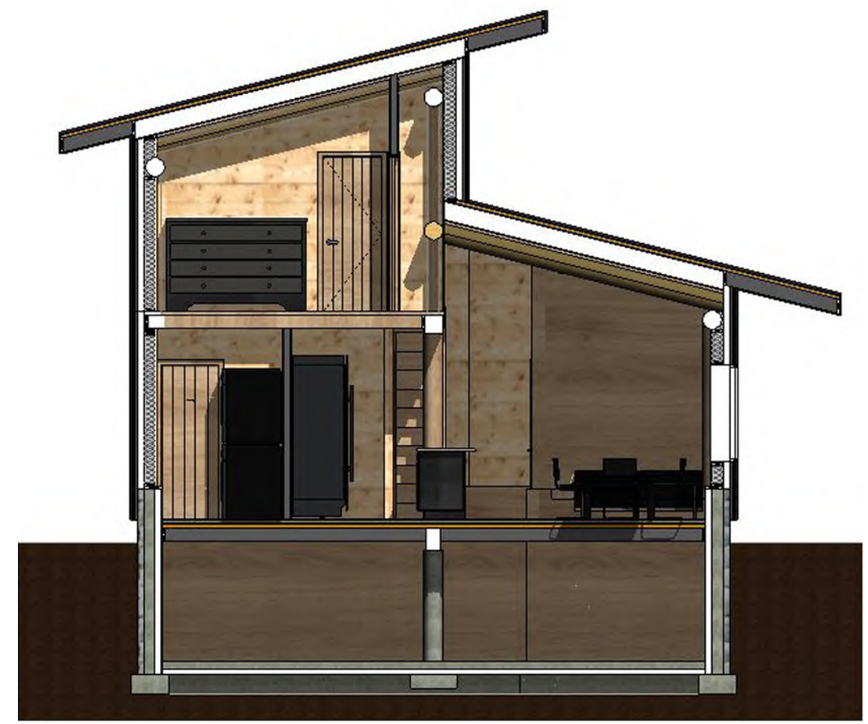
SECOND FLOOR PLAN | MEDIUM

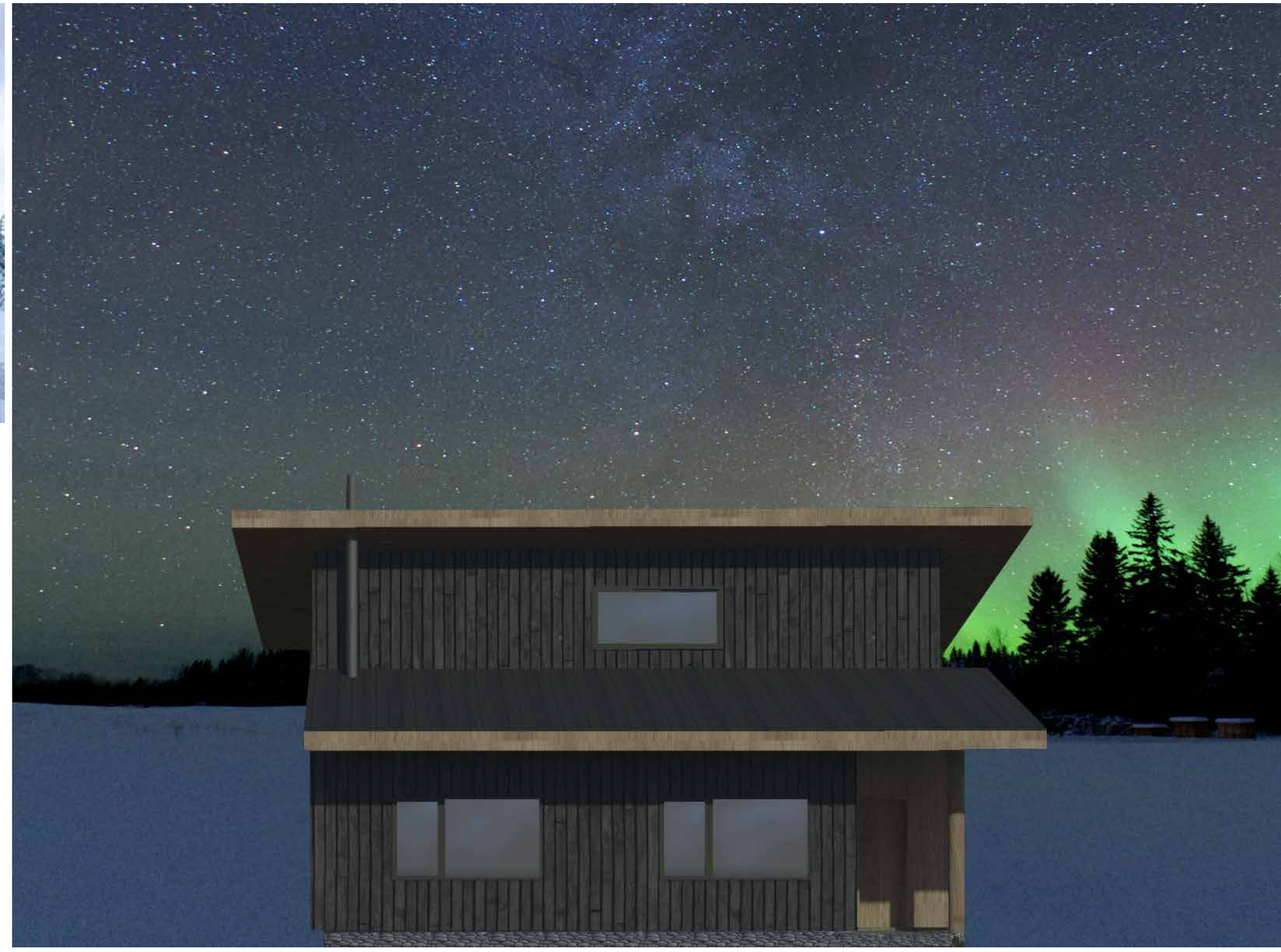


SECOND FLOOR PLAN | LARGE









BUILDING STRUCTURE

The building strcuture is an embedded timberframe, placed in a 2x6 wall system to account for shear strength. The logs are being left in the round as they are stronger in the round without face cuts. The timber being used will be fully seasoned prior to building. The standing dried timber, after it has seasoned for a year standing post forest fire, is no longer green wood; if harvested within the first year after a fire the core is still green and requires time to season and finish 'draining' drying the core for a full season cycle beforeuse. Leaving the wood to stand dry for a year post forest file allows the wood to get to the same humidity content as if it were kiln dried. This project will selectively harvest structural select spruce for the logs and post structures.

BUILDING ENVELOPE

As a part of the Path to Healthy Housing, our goal is to limit the energy demand and heating loading for each of the buildings, and to integrate sovereign utilities to reduce dependence on development of grid utilities. The design intention of this project was to design to passive house/BCBC Step 3 Code Compliance in the envelope design efficiency, in the design of a Net-Zero infrastructure, but to also allow for cultural and local capacity for offsetting heating requirements through the addition of a wood stove (which does not meet passive house standards, but has a significantly lower carbon footprint then the fossil based fuel systems and the building for transmission lines to service building.

The roofs of the building will use a similar method of pre-building sections on site or sips panels (budget dependent) that will allow the roof to be built efficiently on level ground and then be put in place quickly once the log and timber frames are in place. The roofs will be clad in standing seam metal roofing for extended lifespan and durability of the building, and for their ability to shed water and snow which is ideal for this northern climate.

BUILDING MILLWORD & FINISHING

The buildign millowkr will be produced using rough sawn timber and forest fire dried timber salvage, with wood lower cabinet bases being fornmed using simple joinery techniques, and will have pre-cast or cast in place concrete countertops, which will significantly lower millwork costs, and costs of importing cabinets into the remote community

ENERGY:

Community energy is a 3 megawatt Micro-hydro Primary with a Diesel Generator Back-up system. The Micro-hydro is located within 10 km of town and produces more than required for the town, town usage is around 1.3 M
The community of Dease Lake is serviced by an isolated district power grid, that is not tied into the larger BC Hydro Provincial Grid. The micro-hydro is an IPP (Independent Power Project) that is on contract with BC Hydro as the sole power provider for the region surrounding Dease Lake, the micro-hydro is not a Band owned utility, and the costs of heating in-efficient housing in the region is often exorbitant (reaching $2400 bi-monthly) for the cost of heating the inefficient housing on reserve.

WOOD HEAT & WOOD BOILER SYSTEM

The forest fires of 2018, left a significant amount of fuel in close proximity to Tahltan Communities that will be cleared as a part of the community safety plan and as a forest renewal effort, removing the down and standing dried fuel sources, to remove further chance of ignition. Each community within the District has now undergone extensive brushing and fuel source management, which has involved a lot of tree thinning. As such, there is now a large stockpile of logs available, for use as biomass or for wood heating. Tahltan Band is presently in studies for how to manage this resource and to make use of it through either biomass and wood boiler systems, that coupled with Geothermal heating sources would be a suitable secondary heating source for both housing and civic structures. Obsidian Architecture will contribute to substantiating these considerations further, with information gathered within the project study.

GEOTHERMAL POTENTIAL

Currently there are no utilities to site for the Tatl'ah Reserve. There is proven source for high ground water temperatures in close proximity to the reserve, and a high potential for ideal geothermal heating by a ground-sourced heat-pump (at either grouped or district scale) to meet the need for primary heating sources for both housing and civic buildings. The Tahltan Band is interested in pursuing Geothermal Studies as the potential primary heating source. Determining the scale of production needed will be a consideration of this report.

HEALTHY WATER & FILTRATION:

At present there is no water utility available in close proximity for connection for the new Reserve. There is a creek that flows past the reserve and the lake is in close proximity, there is a potential for high water table within the new reserve, however it has not been tested for depth or quality. Ideally, water testing would be included as a part of this study, coupled with a geotechnical evaluation.

Within the region, much of the water that services the houses in Dease Lake has a distinct sulfur smell to it and many prefer to get spring-sourced drinking water. Access to clean drinking water, and the elimination of boil-water advisories is a priority Nationally, and something that should be eradicated within remote and northern communities. Resultantly, as a part of this exercise, we will consider that each house (or grouping of houses), will be serviced by a well and that pumping and filtration will be a part of the building scope of on-board utilities. This could also be considered as a group-able or block scaled utility, for efficiency and reduction of Capital costs for construction as well as O&M costs.

SEPTIC:
Septic treatment for the building units will be coupled between houses, with a dual stage septic tank with leaching field. The solids from the first stage of the septic tank will need to be pumped on a bi-annual to annual basis. Alternately or further housing development of the site, considerations for an anaerobic digester will be considered for larger housing developments, however these systems require more caution and consideration for what cleaning products and contents are being flushed into a system,a t higher caution than septic fields.
As an environmentally considerate community effort, the use of phosphatase and phthalates, and sulphates and bleaches in bathing and cleaning products should be removed from our products. To encourage this further, the stores in town would have to be brought on board to remove the common household cleaners in favour of environmentally biodegradable and system friendly products only. Additionally all residents and guests would need to be made aware of systems care, through appropriate signage.

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IMAGE 30: Geothermal trench evacuation , Golden, BC
Phillips Residence, trenching excavation of ground loops , for source collection field with four separate loops placed in a 9' deep x 40' long trenches. Water table fluctuated between 10' x 12' on average depth in summer + winter. Spring has lots of surface water Frost is 4' deep. House has has 4 tonne Ground Sourced Water-to-water heat pump with interior and exterior isolated loops as primary heat source of in floor radiant pex in 6" loops in slab heat.

29 IMAGE 29: prefabricated post framed cabinetry and being assembled in Phillips Residence, in preparation for pouring the concrete countertops.

PILOT PROJECT:
CASE STUDY TIMBER HOUSE

We are presently in the preliminary planning stages to implement a pilot project build of these designs that will allow us to work directly with the construction training program in Dease Lake. This will be a great testing ground for the project and to see how we can make this design more efficient.

As a part of the training workshops, we will build different sized half and full wall mock-ups as models for construction sequencing, and as a means to be able to see the effectiveness of each of the exterior wall systems illustrated withinin the drawing set.

We would like to be able to build one of each of the sizes of the house desings, S.M.L.XL, as well as try to build one of the smaller houses on a pile system, and one with ICF foundations. we will have some fo the houses be completely off grid, and further work to simplify the building utilities and systems to be fully self-sustaining.

Our next steps will be to ecure further project partners and funding to work on developing the project further, and including more community members and young membership in our building and design teams, to fully maximize the benefits and outcomes for training,a nd to allow our young membership to feel empowered into home ownership through sweat equity.

This project will make use of local materials and local labour to the fullest extent possible. Stiting for the housing will be focused towards builing out child centreed and family centered community complexes, that our young people feel safe and are supported within. We want the housing project and the future pilot project to help shape a community of practice for generationally integrated and collective living opprotunities, that allow younger and older community members to live co-operatively pooling and sharing resources and time, to build out community structures together. The Tatl'ah Reserve site has been identified as teh ideal site to build out a pilot community, with the focus of child centered community design, and shared community workshpaces, workshops, gardens and cultural and spiritual spaces, as a self-reliant, off-grid community. The community could be located along the river side of the reserve, with central spaces in the centre. The Tatcho Reserve would also be the ideal site for the log yard and the mill site, with easy access to the place them across the highway from the community.

INITIAL PILOT PROJECT CONSTRUCTION BUDGET
FOR THE 24'X24' FRAMING MODEL

LOG SALVAGE PROGRAM	$20,000.00
TOOL & TRAINING BUDGET	$65,000.00
FOUNDATION & UTILITIES:	$35,000.00
STRUCTURE:	$31,000.00
ROOF:	$12,000.00
INSULATION & ENVELOPE:	$18,000.00
WINDOWS	$12,000.00
BATHROOM & KITCHEN FIXTURES	$10,000.00
PLUMBING & ELEC	$ 6,000.00
GEOTHERMAL	$18,000.00
OTHER	$13,000.00
	$240,000.00
CONTINGENCY @ 10%	$24,000.00
SUB-TOTAL	$264,000.00

This costing is our first pass at rought costing, The plan set is presently being costed for our first pilot build, which will take place int he spring of 2021.

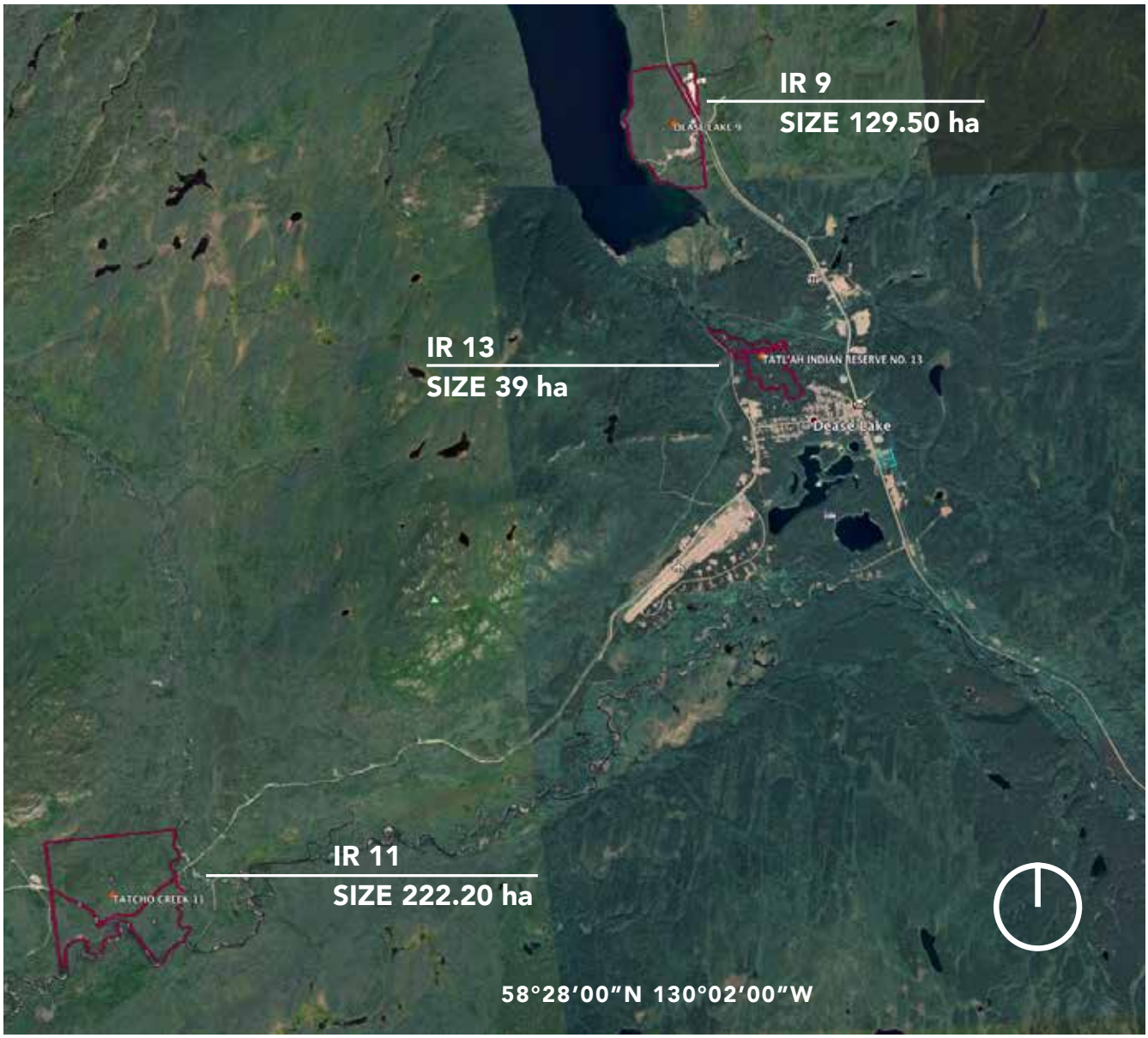

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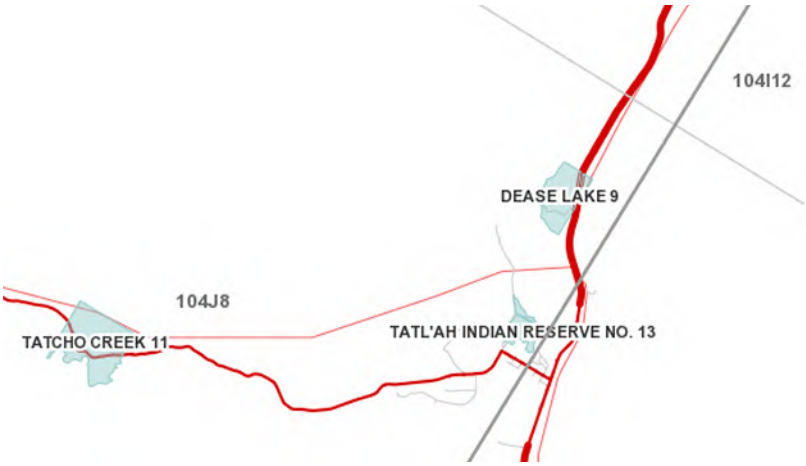
IMAGE 32: GoogleEarth Topographic maps August 2019



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PILOT PROJECT SITE CONSIDERATIONS

There are three sites being considered for the pilot project preliminary build sites. Ir 13 was suggested by the Tahltan Band for new housing, however younger membership have also identified that they would rather be on the riverfront and have property outside of the IR 13 site that gets more southern light, and to be outside of the Dease Lake townsite.

Site 2 has been brought forward as a potential build site for one house from a young Tahltan member that has family property, and site 3 and 4 are both in private ownership by parents and child, and have a couple acre sites, with opotential to subdivide, which is an enticing option for phased development. The plan set site drawings have been laid out for site 4 as a part of a subdivision ideation.

31

IMAGE 31:

GoogleEarth Topographic image of Dease Lake Townsite, BC August 2019

SITE 1:TATL'AH IR13

Located directly north west of Dease Lake: access of off Dease Lake Avenue within close walking distance of the rec centre and school. No development, no utilities, no set road infrastructure. Great potential for district geothermal heating system. Land parcl and division still to commence. timeline to construction could happen fall 2020.

SITE 2:HIGHWAY 37 Property

Located off of highway 37, these 10 acre parcels have artesian wells, and excelent geothermal potential for heating, with a proven ground water temperature of 16 decrees celcius. Land is titled, constrcution could begin asap

SITE 3:Skubovious Property

Located off of highway 37 access road, this 5 acre parcel already has full utilities, and a workshop, a previous residence, and some ancillary spaces. Consideration for building a secondary residence r residences at the back of the proerty at lake front access

SITE 4:Stikine Place Subdivision

Located on the southwest corner of town, there are 6 roughly one acre parcels. Subdivision can be completed and registered asap, and constctuion can begin asap. Hydro, artesian well already on site, septic plan with dual stage chamber system and leaching field design is permitted but not yet built.

IMAGE 2: Tahltan Button Blanket made by Tsema Igharas

" This work envisions utilizing forest fire salvaged timber and focussing community capacity into construction, building cultural model housing in a Tahltan dialect of building that is specific to climate and use. May the forest of our Taltan knowledge replenish this fertile grounds that we call home ."

Kelly Edzerza-Bapty, Obsidian Architecture Ltd.

PHASE 1: ARCHITECTURAL DESIGN & ENGINEERING (FULLY FUNDED THROUGH NRCC SD-CD)

1.1 SCHEMATIC DESIGN: COMPLETE
1.2 DESIGN DEVELOPMENT COMPLETE
1.3 CONSTRUCTION DOCUMENTS 95%, NEED TO REVIEW SITE DESIGN & CM

1.4 CONSTRUCTION ADMINISTRATION - in progress
1.5 SYSTEMS COMMISSIONING
1.6 FF&E + OCCUPANCY + M&O

PHASE 2: HOUSING FEASIBILITY STUDY (DEASE LAKE AREA) (seeking funding)

2.1 Finish Site Analysis of each property and prepare financial review and logistics for each
2.2 Establish Financial plan & project budget
2.3 Liaise with local authorities having jurisdiction for permitting
2.4 Coordinate Project with stakeholders
2.5 Connect with Stikine Housing Authority

PHASE 3: PILOT PROJECT CONSTRUCTION (funding applications in review)

3.1 Coordination of Housing Construction Training Program
3.2 Log & Timber Training Course
3.3 Foundations Preparation
3.4 Timber structure erected on site
3.4 Lock-tight Constrcution for winter
3.5 Interior finishing through winter

PHASE 4: HOUSING STRATEGY DEVELOPMENT

4.1 Feasibility study to begin summer - fall of 2020
4.2 Lands assessment and fulsome site analysis to take place
4.3 Coordination of investment funding fall 2020

PHASE 5: FOREST FIRE TIMBER SALVAGE PROGRAM

5.1 Planning underway for summer and winter salvage program
5.2 Assessment of salvageable timber to begin asap
5.3 Log yard application in development

PHASE 6: TIMBER HOUSING FABRICATION FACILITY

6.1 Construction organization in initial planning
6.2 Facility schematic design in progress
6.3 Stakeholder engagement to commence in summer 2020
6.4 Business plan to be developed summer-fall 2020

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TA'UNE [WHEN THE SNOW MELTS]

Images 34 & 35
Photos of Kelly Edzerza-Bapty wearing Ch'iyōne Kimē Button Blanket, Photographer Adam Amir

KELLY (EDZERZA) BAPTY, ARCHITECT AIBC , PRINCIPAL, OBSIDIAN ARCHITECTURE LTD

Ta'une is the name given to Kelly Bapty by her Maternal Grandmother, Nithteyah (Grace Edzerza), she is a member of the Etzenlee Matriarch of the Tahlogo Dena Ch'iyÐne KimÐ (Wolf Clan), the Grandaughter to her maternal Grandfather Aguthe Tah (George Edzerza) of the Eth'eni KimÐ, and Great Granddaughter of Nannok (signatory to the Tahltan Declaration of Nation of 1910). Kelly was raised under the blanket of stars and dancing auroras that cover the night sky in an arctic fall. She was raised in both the NWT & northern BC, and has resided and worked within some of the most remote communities throughout BC, Yukon and NWT. Many of these communities deal with extreme climate conditions, and are subject to significant fluctuations in seasonal temperature and short building seasons with limited access to materials, that make the challenge of building within these regions more complex, and requiring more coordination and planning to carry out Construction logistics. As such, she has an intimate knowledge of building within the remote climate conditions of deep long winters, Chinook weather systems, and northern boreal geography and climate. She is intimately familiar with the full seasons and incremental seasonal shifts that the Tahltan Territory is positioned within.

For the last 15 years Kelly has been an Indigenous Design Consultant with several firms throughout the north. Presently Kelly is the owner of Azziza and Indigenous Design Studio, and the Founding Principal of Obsidian Architecture Ltd. She is also the Forming Co-Founder of ReMatriate and Indigenous Womens Self Representation Campaign. Kelly has also sat as the Etzenlee Family Board of Directors alternate and youth representative since 2010. Kelly spends time every summer, with her family fishing from their family camp along the Stikine River.

OBSIDIAN ARCHITECTURE LTD. is an indigenous owned practice, lead by Principal Kelly Edzerza-Bapty, Architect AIBC. The firm is based out of Golden BC in the north Kootenay region of the province in the heart of the Rockies, but it's practice and projects are spread throughout some of the most remote regions of British Columbia and the Yukon. Obsidian Architecture is one of a small collection of Indigenous Architecture practices within Canada, they are uniquely situated to help guide the profession and the development of indigenous practice and process for indigenous projects from an indigenous perspective.

Over the years, the work of Principal Kelly Edzerza-Bapty has brought her into some of the most remote communities in western Canada, each project has provided a unique climate, culture and intricate logistics for building design for remote and off-grid construction. Each community has shared invaluable knowledge and lessons on what it means to survive and evolve from the landscapes that they have cultivated, navigated and inhabited for generations unknown. For these experiences and opportunities to listen and create from the communities vision and cultural knowledge, we are appreciative and humbled.

We understand the significance of buildings that represent our indigenous visual identities have as markers of our cultural practices. We strongly believe that as architects we carry part of the responsibility to help the communities that we work with to see themselves represented within their built environment, at an embedded level. We strive to ensure that we hear the voices and extend the opportunities to the knowledge carriers and makers within a community to assure that we have authentic cultural representations of the community, and are integrating the vision, knowledge and skills of the community into the design process. To produce buildings that truly belong to the community.

At OBSIDIAN we believe that planning our communities with foresight and holistic thinking; integrating traditional healing and food preparation, gathering and cultural teachings as key aspects of weaving our Integrated communities for a resilient future; She see's this as an integral part of finding balance again within our indigenous communities, and in what we have to offer and share of our knowledge of our place in this world. Kelly has dedicated the focus of her practice to the process of re-building Indigenous Communities and Cultural Centres, from within their own capacity, seeing Architecture as a tool of autonomy for Indigenous Nations.

At obsidian Architecture, in the indigenous context we see art and architecture as a symbiotic relationship, as it our connectivity with the ecosystems that we live within. We see our buildings as an extension of this world view. British Columbia Indigenous Peoples have adapted for millennial to live and thrive within their climates and biospheres, there is intrinsic knowledge that exists within the building styles and community planning of every indigenous nation. At OBSIDIAN we work directly with communities and their projects to help them realize their vision of built environments, and do so with their specific climate in mind. Our projects seek to be localized to the needs, economy and capacity of specific geographies. Our areas of specialty are designing for indigenous communities in remote and small communities. We see our projects from both the perspectives as small indigenous community members ourselves, and as people working towards social and cultural revitalization of our indigenous Territories, so that we can live fulsome and rewarding lives within our Indigenous Territories. We are the generation moving home. very regionally specific