

CONFIDENTIAL

BEST
SMALL &
MEDIUM
EMPLOYERS IN CANADA

RANKED #2
NATIONALLY
2010

March 11, 2011

THE
GREEN 30
2010

Our Reference: TAC / ATC

Transportation Association of Canada

2323, St. Laurent Blvd.
Ottawa, Ontario K1G 4J8

Attention: Josée Bisson
Project Manager

Dear Josée:

Reference: 2011 TAC/ATC Environmental Achievement Award Nomination

ISL nominates the Town of Okotoks for their 32 Street Crossing - Sheep River Re-Alignment Project for the subject award. Please find following this cover a copy of the Abstract submitted previously and a paper in the required format describing the reasons for our nomination.

In brief the Town of Okotoks is nominated for making commendable, innovative plans and executing project decisions to best protect and enhance the environment, despite the enormous challenges inherent in "doing the right thing" for the Sheep River for the benefit of nature, the environment and the citizens' enjoyment. ISL was involved the 32 Street Crossing - Sheep River Re-Alignment as project manager and prime consultant from the start all the way through project completion. During this time we observed the Town of Okotoks repeatedly champion sustainable solutions and demonstrate their enduring commitment to the environment.

ISL Engineering and Land Services Ltd. is honoured to nominate the Town of Okotoks' and proud of our association with the 32 Street Crossing - Sheep River Re-Alignment Project and we thank TAC / ATC's Environment Council for creating the opportunity to submit this nomination.

Sincerely,



Calvin McClary, P.Eng.
Calgary Manager



ABSTRACT TAC 2011 SESSION: 2011 TAC ENVIRONMENTAL ACHIEVEMENT AWARD NOMINATION

TITLE: Okotoks 32 Street Crossing – Sheep River Re-Alignment

PRINCIPAL AUTHOR: Calvin T. McClary, P.Eng., Calgary Manager, ISL Engineering and Land Services Ltd.

ADDRESS: #1, 6325 - 12 Street SE, Calgary, Alberta, Canada T2H 2K1

TELEPHONE: 403.254.0544; **FACSIMILE:** 403.254.9186; **EMAIL:** cmclary@islengineering.com

Okotoks' 32 Street Crossing project involved designing and building a new arterial roadway from Cimarron Estates Drive to North Railway Street within one year. Costing \$26 Million, it included 1.4km of roadway, regional pathways, two bridges over the CPR track and Sheep River, and a unique 750m major river diversion within the flood plain. Completed within tight timelines set by the federal Infrastructure Stimulus Fund, the project provides uninterrupted access between north and south Okotoks. ISL Engineering and Land Services lead a multi-disciplinary consulting team that included partners Golder Associates, who contributed significantly in hydraulics, flood management and biophysical science. Executing the Sheep River relocation was a critical task for the project, and involved active participation and planning by the Town, ISL, Golder and the contractor, Chief Construction. The new Sheep River channel began receiving measured flows on August 5 and was fully diverted by August 9, 2010. This followed a two month preparatory period to construct the new channel and complete all necessary habitat compensation work. ***Prior to design and construction a two year permitting process under rigorous scrutiny by Alberta Environment, Department of Fisheries and Oceans and Transport Canada, Navigable Waters proved relocating the river was the right approach and in the best long term environmental interest of the project.***

Formal permit applications for the project were made in March 2009, initiating processes that culminated in project approvals through 2009 and 2010. Due to schedule constraints, the Town carried acknowledged risk in proceeding with portions of construction prior to obtaining final approvals for the remaining portions, but the strategy of early engagement and continuous communication with the permitting agencies helped mitigate the risk and provide reasonable assurance of the final outcome well in advance. This preliminary work was especially valuable in accelerating a mandatory review by the Canadian Environmental Assessment Agency (CEAA), and made federal infrastructure stimulus funding possible.

The key project innovation of relocating the Sheep River was initially conceived through air photo review of the river and its history. Records indicated that river migration near the 32 Street crossing had progressed more than 300 m over the past century, developing a major meander in this particular reach. The river flow is in a south-easterly direction and constructing a new bridge at the 2008 location, just downstream from another fixed constraint where the CPR crosses the Sheep River, would have in effect permanently directed the flow of the river in the north-easterly direction. This, in turn, would significantly increase erosion around the downstream meander, and put adjacent land at greater risk of being cut off by a new river channel during a future major flood event. Fixing the bridge at a more southerly location would instead better direct the river in the prevailing direction while reducing the risk of downstream erosion and isolation. Through air photo interpretation, a historic river course that was active from the 1950s to the 1970s was confirmed and selected for the crossing location.

River engineering included design of a 750 m diversion channel that accommodates a 1:2 year flood event within its banks. It is anticipated that natural flood forces will realign the channel to its natural course over time, as has occurred in the past, within the confines of guide-banks installed along and downstream of the diversion channel. The rip-rap guide-banks are heavily armored and built up to the 1:100 year flood level plus additional freeboard, to ensure effectiveness while passing the design flow of 954 m³/s at significant velocities. The construction of a new bridge crossing and realignment of the river had a significant potential impact on flood management for the Town of Okotoks. Major floods are not an uncommon occurrence in this reach of the river, with the most recent memorable events occurring in 1995 and 2005. Flood mapping for the Town had been updated by Alberta Environment following the 2005 event, and required revision as part of the Sheep River approvals process. Golder re-visited and updated work done in a previous Provincial study that predicted the flood limits in areas adjacent to the river throughout Okotoks, confirming that the new crossing would have no additional adverse impact. AB ENV also required a complete report similar in form to their original work and updated to reflect changes to river and a public process to ensure affected stakeholders were informed. An Open House was also required, so exhibits were prepared and presented.

Federal requirements for HADD (Habitat Alteration, Disruption or Destruction) Compensation required extensive evaluation and negotiations. Obtaining formal concurrence of NAV Canada required additional submissions and a diversion of this length combined with integration of HADD features within the project limits had not been undertaken before, which resulted in increased diligence from the approval agencies for this cost effective solution. Also, the DFO and NAV objectives were essentially at odds; with DFO wanting to place HADD in the new channel and NAV viewing such HADD as an obstruction to navigation, which is to be avoided. Reconciling these viewpoints required lengthy careful planning, design and negotiation.

OVERVIEW - 2011 TAC ENVIRONMENTAL ACHIEVEMENT AWARD NOMINATION

ISL nominates the Town of Okotoks for their 32 Street Crossing - Sheep River Re-Alignment Project. The Town of Okotoks is nominated for making commendable, innovative plans and executing project decisions to best protect and enhance the environment, despite the enormous challenges inherent in “doing the right thing” for the Sheep River Valley for the benefit of nature and its’ citizens’ enjoyment.

The first decision in the best interest of the Sheep River Valley was to re-visit a Functional Planning Study completed nearly a decade ago that, for reasons long forgotten, neither resulted in an optimum alignment for the road nor adequate environmental accommodations for the nature and its enjoyment in the Sheep River Valley. There is a protected a natural environment adjacent to the river all along its banks for the entire length inside Town limits. This environment is well used by residents who also advocate for preservation and enhancement via a River Valley Committee of citizens with whom the Town Administration work for this purpose. Employing a sustainable approach to delivering a better future resulted in the arriving at the desired end of a wider opening under the bridge for better water and wildlife passage in combination with improving the roadway alignment to a single, large radius curve. Back-casting from this vision of an improved future, a way was seen where it may be realized.

Due to the placement and orientation of a railway trestle built long ago, the Sheep River was directed to slowly erode north-eastward and eventually meander through a part of the flood plain it had created in pre-historic times. If the Town constructed the new road it needed and built the bridge over the river where it existed, the river would effectively become a huge hose pointed at the flood plain, waiting to cut through it during the next significant flood event washing silt and sediment into prime habitat for fish. It was noted during the very first meeting with Alberta Environment, the Department of Fisheries and Oceans, and Navigable Waters that while all attendees agreed moving the river was the best approach; it represented a significant permitting and approval challenge that had never been done on this scale previously in Alberta if not all of Canada. The Town indicated that it wanted to do the right thing for the river and pointed to the obvious absurdity of challenge in government process causing a less than desirable configuration for the roadway and bridge it needed to construct.

The agencies involved acknowledged a fundamental truth in the Town position and after considering the alternatives agreed re-aligning the river was the best way forward, so long as their permitting and approval requirements were met. The Town was convinced this could be done, so the second key decision was made to re-locate the river channel and a way forward was set. These two decisions were bold and set a high standard for subsequent planning and design on the project both regards to the level of thoroughness required and in terms of protecting the environment and minimizing impact.

The Town took a sustainable holistic approach with a keen interest in protecting the environment for future generations, which resulted in a more carefully considered plan and increased value obtained by thorough careful design. The capital budget for 32 Street Crossing – Sheep River Re-Alignment Project was \$33.0 Million. The forecast cost at completion now stands firmly at \$29.0 Million and it is unarguable the extended planning and design efforts required by the permitting process contributed significantly to the 12% savings realized by the Town during project detail design and construction.

The Town undertook to improve and enhance the river valley environment by constructing controlled nature trails for its enjoyment and leaving the south abutment of the river in as near a natural state as can be achieved to provide for the passage of wildlife. While the flood plain on the south side was by and large in a natural state, the riparian area at the upper limits of the 100 year flood elevation had been previously mined for naturally occurring gravel deposits and then reclaimed for agricultural purposes. The Town had acquired this land for municipal purpose via the land development process and chose to re-naturalize these areas at the same time in consort with the mitigation of the impacts of construction in the main flood plain. River sediments and topsoil containing seeds and stalks from indigenous species of plants were saved in separate stockpiles and used exclusively for naturalizing all the riparian areas of the river valley. Costs and schedule were minimized by avoiding export or import of soils for landscaping from or to the project, while returning the area to a near natural state.

Prior to the design and construction, a two year permitting process under rigorous scrutiny by Alberta Environment, Department of Fisheries and Oceans, and Transport Canada, Navigable Waters it was determined relocating the river was the best approach in protecting long-term environmental interests. Okotoks is nominated for a demonstrated commitment to best protect and enhance the environment.

2011 TAC ENVIRONMENTAL ACHIEVEMENT AWARD NOMINATION

Project Background

Planned since the early 1990s, the 32 Street Crossing is the largest infrastructure initiative ever undertaken by the Town of Okotoks, a community of about 24,000 people south of Calgary. The new arterial roadway provides the Town with a second river crossing, completing an important new link in the regional transportation network and alternative to Highway 2A for commercial truck traffic.

The new two-lane roadway curves through the valley and crosses the Sheep River on a 140 m long three-span bridge. Via a comprehensive Preliminary Engineering study, ISL Engineering and Land Services, with our sub-consultant partners Golder Associates, arrived at a solution that ultimately saw construction of the new bridge occur “in the dry” over an inactive area of the river valley, with the Sheep River then diverted under the bridge through a reconstructed “old” channel. The project also included an overpass of the CPR, the only such crossing in the Foothills region west of Highway 2.

The project scope included addressing such challenges as: negotiating cost-sharing with CPR on the rail overpass structure; obtaining the necessary Federal and Provincial permits for the river crossing; and supporting the Town on the funding request for the \$33 million project under Infrastructure Canada’s economic stimulus program. Designed and built-on a fast-track basis in order to meet the firm schedule requirements of the federal stimulus fund, meant the roadway had to be opened to traffic by November 2010, just one year after construction began. Having worked to minimize the construction footprint and preserve much of the existing natural environment in the river valley, the bridge will leave a lasting legacy of sustainable transportation design in the Town of Okotoks, Alberta.

Roadway Planning and Design

ISL Engineering and Land Services (ISL) were first engaged by the Town of Okotoks in mid-2008 to complete preliminary design for the 32 Street crossing of Sheep River. On review of prior functional planning for the corridor dating from 1991 and 2005, numerous deficiencies were identified including: provision for an at-grade crossing of the CPR tracks; crossing the Sheep River on a short, single-span bridge; and a roadway alignment with a relatively tight horizontal curve and steep vertical profile.

Building on the previous plan, ISL and our design team brought a fresh approach to the project that sought to optimize and improve the design while meeting the key technical objectives of providing a safe, high-capacity road connection that effectively crosses the Sheep River and accommodates the 1:100 year design flood. Working with Golder Associates, who provided key expertise in river hydraulics and flood management, an early innovation in the preliminary design process was to recommend that the Sheep River be relocated to a previous historic channel approximately 150 m south of the then-current alignment. This would straighten a meander in the river, reduce the potential for further migration and mitigate possible future flood damage on downstream lands.

With the concept of relocating the Sheep River as an overarching theme, additional optimization of the functional planning could follow. This included revising the roadway alignment to a single, large radius curve over both the CPR and Sheep River crossings, with a vertical profile that gradually “falls” through the river valley from south to north. This final alignment significantly improved roadway safety by moving its design domain well beyond “minimum” parameters and through improving sightlines by eliminating crest curves on the Sheep River Bridge. The modified alignment also enhanced roadway aesthetics by adapting naturally to the contours and vegetation of the river valley and by providing roadway users with sweeping vistas of the valley and hills beyond.

Structural Design

The 32 Street Crossings includes two major bridge structures, carrying the roadway over the CPR tracks and the Sheep River, respectively. The inclusion of the CPR overpass in the project was a particularly important strategic achievement for the Town of Okotoks. The three existing at grade crossings within the Town are all located in the downtown area and are often blocked by trains, impeding emergency service operations and the flow of commercial traffic. The new CPR overpass ensures unimpeded flow for this traffic, and has played into the Town's future planning for EMS stations and other emergency facilities. It will also be the Town's only river crossing with the surface of the roadway entirely above the 1:100 year flood level, ensuring emergency access during floods.

Prior functional planning envisioned the Sheep River Bridge as a single span bridge, with a bridge-sized culvert to supplement flood passage and wildlife movement. During preliminary design, ISL instead recommended a 140 m, three-span bridge arrangement that would accommodate valley users, wildlife movement and flood passage through three, spacious openings. The increased span(s) helps maximize the ongoing use and enjoyment of the river valley and its natural features.

Bridge aesthetics were of great interest to the Town, with an objective to build a cost-effective but visually pleasing structure. Working with ISL, early bridge concepts were developed by David C. Woodall, P. Eng. It includes such features as pier foundations cast and finished to imitate local river rock boulders, thus evoking a forgotten approach to bridge building, topped by modern concrete arms splayed in different directions and carrying a crosshead that supports a superstructure on five pre-cast, pre-stressed and post-tensioned NU girders. Spacing of the girders was optimized for economy and effect, with wide overhangs that look light and minimize the apparent depth to span ratio.

In effect, the design brings a human scale and understanding of an increasingly complex structure rising out of the river bridging the river, pathways and wildlife corridor. Detailed analysis and design by ISL addressed significant complexities arising from the aesthetic choices, particularly the complex torsional forces inherent in the splayed pier design. Constructing the bridge over dry land saved both time and money with, the contractor advising of a saving three months' time and 8% to 10% in cost.

Sheep River Design

The key project innovation of relocating the Sheep River was initially conceived through air photo review of the river and its history. Records indicated that river migration at this location progressed more than 300 m over the past century, developing a major meander in this particular reach. While prevailing flow is in a south-easterly direction, constructing a new bridge at the 2008 location, just downstream from another fixed constraint where the CPR crosses the Sheep River, would have in effect permanently directed the flow of the river in the north-easterly direction. This, in turn, would have significantly increased erosion around the downstream meander, and put adjacent occupied land at great risk of being cut off by a new river channel during a future major flood event. Fixing the bridge at a more southerly location would instead better direct the river in its prevailing direction while reducing the risk of downstream erosion and isolation. Through air photo interpretation, a historic river course active from the 1950's to 1970's was confirmed and selected for the crossing location.

River engineering included design of a 750 m diversion channel that accommodates a 1:2 year flood event within its banks. Natural flood forces will realign the channel to a natural course over time, as has occurred in the past, within the confines of guide-banks installed along and downstream of the diversion channel. The rip-rap guide-banks are heavily armoured and built up to the 1:100 year flood level plus additional freeboard, to pass the 100 year design flow of 954 m³/s at significant velocities.

A new bridge and realignment of the river had a significant potential impact on flood management. Major floods are a common occurrence in this reach of the river, with recent memorable events in 1995 and 2005. Flood maps for the Town had been updated by Alberta Environment following the 2005 event, and required updating again as part of the Sheep River approvals process. Work done in a previous Provincial study that predicted the flood limits in areas adjacent to the river through the Town was updated, confirming that the new crossing would have no significant adverse impact.

Environmental Permitting

New construction of the magnitude of the Sheep River Bridge is of significant interest to regulatory authorities at all levels of government. Realizing the complexity of issues involved and recognizing the need to secure preliminary approval of the river relocation concept prior to advancing design on that basis, the Town and ISL engaged the responsible provincial and federal agencies early in the preliminary design process, more than a year ahead of expected construction. Agencies with jurisdiction included Fisheries & Oceans Canada (for protection of fisheries) and Transport Canada (for protection of navigable waters) at the federal level, and Alberta Environment (for protection of the Sheep River as a water resource, and flood management), Alberta Sustainable Resource Development (for protection of the Sheep River shoreline and terrestrial habitat) and Alberta Culture and Community Spirit (for protection of historic resources) at the provincial level. The initial meetings held in late 2008 were effective in raising awareness of the project with permitting authorities, and in obtaining their early and ongoing buy-in to the proposed engineering solutions as they evolved through the design and construction phases. All agencies involved agreed that, by re-aligning the river, the Town of Okotoks was doing the “right thing” to protect and enhance the environment.

Formal permit applications were made in March 2009, initiating processes that culminated in project approvals during 2009 and 2010. Due to schedule constraints, the Town carried acknowledged risk in proceeding with portions of construction prior to obtaining final approvals for remaining portions. The strategy of early engagement and continuous communication with permitting agencies helped mitigate the risk and provide reasonable assurance of the final outcome well in advance. This preliminary work was especially valuable in accelerating a successful review by the Canadian Environmental Assessment Agency (CEAA), and made federal infrastructure funding possible.

Project Funding and Schedule

Budgeted at \$33 million, the 32 Street Crossing is the largest infrastructure project ever undertaken by the Town of Okotoks, or by any comparable municipality of its size in Alberta. Efforts to obtain funding and initiate this key transportation project were unsuccessful in prior years, with major funding requests rejected by the Province as recently as 2008 due to differing priorities and a focus on larger cities. A new opportunity arose early in 2009, when the Federal Government announced they would fund “shovel ready” infrastructure projects as part of the economic stimulus plan. The preliminary work already completed by ISL in 2008, including the active engagement of permitting agencies, provided senior levels of government with the necessary assurance that the Town could manage and complete the project within the mandated timeframe, with a firm funding deadline of March 31, 2011.

The Town’s funding application, including the parallel CEAA and permit approvals processes, carried on through spring 2009. At the time, ISL had devised a project schedule that would allow for design and construction through summer and fall 2009 to allow for substantial completion by the end of 2010 to meet the March 2011 deadline. Funding, however, was not confirmed until September 2, 2009, which compressed schedule even further and required an accelerated design / construction process.

To meet the new schedule, ISL proceeded with a fast-track design and staged construction approach. A preliminary construction schedule was developed for the entire project, recognizing the need to complete the Sheep River diversion within the mandated “fish window” between July 15 and August 31, 2010 and to complete the balance of the project before winter freeze-up at the end of 2010. By laying out the full project sequence, design efforts focused on critical path items allowing construction to commence in parallel with the balance of the design. So, the first contract to rough grade bridge approach fills was underway by mid-October, within six weeks of the funding announcement. Then construction proceeded on-track with the original construction schedule, with the bridge set to open by November 2010 and the Town meeting its commitment to deliver the project before March 2011.

In fact the project was substantially complete before November 2010 and the roadway was officially opened November 27, 2010. Federal, Provincial and Town officials attended the ceremony with the federal representative reported to have wished that all stimulus projects had been delivered as well.

Project Delivery and Partnering

Construction of the 32 Street Crossing was split into four separate contracts that were publically tendered between September 2009 and May 2010. In addition to accelerating the project delivery schedule, the division of contracts into Rough Grading, Bridge Structures, Road Works, and River Works had the additional benefit of allowing a wider variety of general contractors to bid on the work, focusing on their areas of specialization. Separate contracts also allowed smaller local contractors to participate in the project, with Okotoks based firms securing two of the four contracts and helping to support the Federal stimulus objective of local job creation as well as more competitive pricing.

Successful coordination and delivery of the project with separate general contractors was aided through project partnering sessions facilitated by Dr. George Jergeas (K-3 Project Management). The initial sessions developed a Project Vision and confirmed team buy-in to the milestone dates necessary to achieve the overall schedule. After each contract award, partnering encouraged new project team members to bring forward risks best understood by them in an atmosphere of mutual cooperation and positive communication. A risk-sharing approach by the Town supported a real atmosphere of trust among all parties and saved considerable time and money in project delivery.

Early engagement of external stakeholders was also a key to successful project delivery. Working with CPR, the Town agreed to front-end a longer railway overpass structure to accommodate and encourage future expansion of rail infrastructure for possible Regional Commuter Rail use.

Coordination with CPR also allowed for provision of safe, temporary at-grade rail crossings to facilitate construction at site. Utilities such as ATCO Pipelines and Fortis were also cooperative.

Another key external stakeholder was the Town's River Valley Committee, who contributed to the project by making suggestions with respect to pathway access and other amenities for the use and enjoyment of the Sheep River Valley. It is noteworthy and a testament to the Town's consultation process that a project of such potential impact on a valued natural environment proceeded through the design, approval and construction phases with literally no public complaints or opposition.

Roadway and Bridge Construction

A key benefit of the river relocation was that the Sheep River Bridge could be constructed "in the dry", i.e. construction occurred entirely on an inactive part of the valley floor, while the existing river flowed around the construction site. This significantly mitigated the environmental and safety risks normally associated with working over open water, and provided for faster construction, especially constructing the foundations, abutments and piers. By the time the river channel was diverted under it in August 2010, the bridge was substantially complete and ready to be used by the road contractor to continue construction work in the former channel areas. Having the structure available for the remaining road construction allowed borrow material to be sourced from the opposite side of the river, and for the entire project to be constructed without equipment ever crossing through the active river channel.

Careful attention to staging the work and limiting its footprint helped preserve the existing natural features, ensuring that the valley remains a natural, accessible and visually pleasing setting post-construction. Barren gravel areas adjacent to the old channel have been re-naturalized with loam salvaged from the river valley, and planted with native local plants salvaged from the anticipated future river migration areas. Roadway embankments were seeded with native grasses on recycled loam early in the construction process, with much of the vegetation already having grown in and contributing to a "green" look for the project. Viewpoints have been constructed on both ends of the Sheep River bridge structure, allowing pathway users to pause and enjoy vistas of the river valley.

The bridge itself also contributes to the overall aesthetics of the valley, with river-rock architectural treatments, and a distinctive art feature in the pedestrian railing — designed by ISL's Ron Loepky and New Vision Arts' Dan Laba — that replicates a blue water wave, the symbol of the Town of Okotoks. From project inception Town Council was clear in its desire to have project aesthetics that complimented the river valley and enhanced their citizens' enjoyment of the natural environment.

Sheep River Relocation

Executing the Sheep River relocation was a critical task for the project, and involved planning and active participation by the Town, ISL, Golder and contractor, Chief Construction. The new channel began receiving measured flows on August 5 and the river was fully diverted by August 9, 2010. This followed a two month preparatory period to construct the new channel and complete all of the habitat compensation work. The relocation was planned in advance to proceed under engineered plans for the permit that identified separate five stages of construction with specific requirements for protecting the environment during each stage. A drawing detailing the stages and specifics is in the Appendix.

The drawing was part of the permit applications and details environmental controls for each stage:

- Stage 1 - September 2009 to July 15, 2010 “Bridge Construction”
- Stage 2 - November 2009 to April 2010 “Excavate Relocated River Channel”
- Stage 3 - July 16 to August 31, 2010 “In-Stream Work”
- Stage 4 - September 15, 2010 to October 31, 2010 “Salvage Trees”
- Stage 5 - September 15, 2010 to March 31, 2011 “Natural Re-Vegetation”

That the stages were executed as originally planned and the drawing never needed updating for field conditions reflects the level of thought and planning the Town brought to environmental aspects of the project. The Town's environmental efforts and contractor compliance on the project was subject to regular quality assurance by all agencies. Construction was completed without a complaint or non-compliance noted by any agency. All were satisfied project execution conformed to permit conditions.

Federal requirements for HADD (Habitat Alteration, Disruption or Destruction) Compensation required extensive evaluation and negotiations. Obtaining formal concurrence of Navigable Waters required additional submissions as a diversion of this length combined with integration of HADD features within the project limits had not been undertaken before, which resulted in increased diligence from the approval agencies for this cost effective solution. Also, the DFO and NAV objectives were essentially at odds; with DFO wanting to place HADD in the new channel and NAV viewing such HADD as an obstruction to navigation, which is to be avoided. Reconciling these viewpoints required careful planning, design and negotiation. The Appendix includes details of the HADD Compensation.

The Sheep River provides valuable habitat for Bull Trout, Westslope Cutthroat Trout, Mountain Whitefish and other native and non-native species. Given that an active portion of the river would be replaced with a shorter constructed facility, Fisheries and Oceans Canada (DFO) needed to be assured that no net loss would occur with respect to fish habitat. Golder facilitated discussions between the project team, DFO and Transport Canada to establish acceptable means of improving fish habitat within the newly constructed channel. This included the installation of rocks, root wads, sidebars and riffles, situated to improve fish habitat while maintaining channel navigability. These mitigation measures were also installed in areas surrounding the channel, anticipating future migration of the river. The Sheep River project thus became one of the few major river projects in Canada where fisheries compensation for a shorter channel was successfully addressed on-site.

In preparation for the relocation itself, a careful literature search revealed no prior examples of this size of diversion for meandering alluvial mountain rivers. Without prior specific examples, the environmental protection and best practice processes used for re-aligning other river types were analyzed and adapted to the meandering alluvial nature of the Sheep River. Flow was introduced gradually into the channel and the river was continually monitored for the presence of turbidity and other deleterious conditions. Test records of the diversion confirm that no oils or other contaminants were discharged to the river and that, except for a small, brief spike when the channel was first fully opened, turbidity levels did not exceed regulatory guidelines. Following the diversion, contractor crews salvaged all fish from locations where they were stranded by the disappearing river. All told, more than 11,000 fish were successfully moved to the new channel. As the diversion was so unique, a record of the approaches taken will be presented in various industry forums so that future river diversions and works can benefit from the knowledge gained on the 32 Street Crossing project.

Closure

ISL Engineering and Land Services was involved the 32 Street Crossing - Sheep River Re-Alignment as project manager and prime consultant from the start of updating the Functional Planning Study all the way through project completion. During this time we observed the Town of Okotoks repeatedly champion sustainable solutions and demonstrate their enduring commitment to the environment.

Okotoks is recognized as one of Canada's most sustainable communities. This recognition combined with a continued dedication to make the right project decision for the environment, facilitated dialogue needed amongst the many regulatory agencies. This in turn made a bold solution possible for a new crossing of the Sheep River Valley that completed a much needed link in their transportation network.

This project solution met all the needs for the protection of the environment, and will serve long-term needs of the citizens of the Town in perpetuity. The construction effort recognized and respected the needs of the environment, as supported by the Town, and were achieved through careful planning and staging. The effects of the significantly long river diversion were effectively mitigated by re-using an old historic channel and applying state of the art water and environmental engineering practices.

The project rehabilitated degraded riparian environment to a natural state providing greater passage of wildlife to ensure ecological diversity is maintained along the river. The Town enhanced citizens' enjoyment of the environment by constructing controlled nature trails and pathways along river valley.

All this was achieved within the compressed timelines of funding requirements, at reasonable costs, through co-operation and support of all involved. By visioning a more desired future and making the plans to execute a more sustainable solution in advance of project funding, the Town was able to capitalize on new federal stimulus funding, which resulted in significant savings to the Town with the federal and provincial governments each paying one third of the cost via the stimulus program. This project was completed on schedule and 12% under budget providing additional economic value.

Such planning ensured the project was well received by government agencies with jurisdiction:

- Fisheries & Oceans Canada (protection of fisheries)
- Transport Canada (protection of navigable waters)
- Alberta Environment (environmental protection and flood management)
- Alberta Sustainable Resource Development (protection of shoreline and terrestrial habitat)
- Alberta Culture and Community Spirit (for protection of historic resources)

And finally, addressing the environment's needs via creative engineering and innovation ensured the project satisfied all citizen stakeholders including the Town's River Valley Committee. This positive widely held satisfaction with the delivery of new infrastructure has resulted in a more positive outlook on the part of everyone involved. In fact the active role of the Town's now-retired Mayor Bill McAlpine in working deliver this project over many years was recently recognized by the Town of Okotoks, by naming their new transportation corridor across the valley as "**McAlpine Crossing**" in his honour.

ISL Engineering and Land Services Ltd. is honoured to nominate the Town of Okotoks' and proud of our association with the 32 Street Crossing - Sheep River Re-Alignment Project. We would like to thank TAC/ATC's Environment Council for creating the opportunity to submit this nomination.

Sincerely,



Calvin McClary, P. Eng.,
Calgary Manager, ISL Engineering and Land Services Ltd.

APPENDIX - 2011 TAC ENVIRONMENTAL ACHIEVEMENT AWARD NOMINATION

Project Overview



32 Street Crossing - Sheep River Re-Alignment Project

Roadway Planning and Design

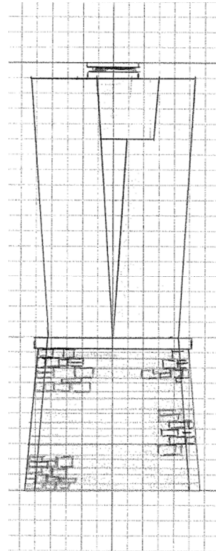


Recommended Corridor Route

Structural Design



Splayed Arm Pier



Early Sketch



Sheep River Bridge

Sheep River Design



Sheep River Valley



Recent Flooding

Environmental Permitting

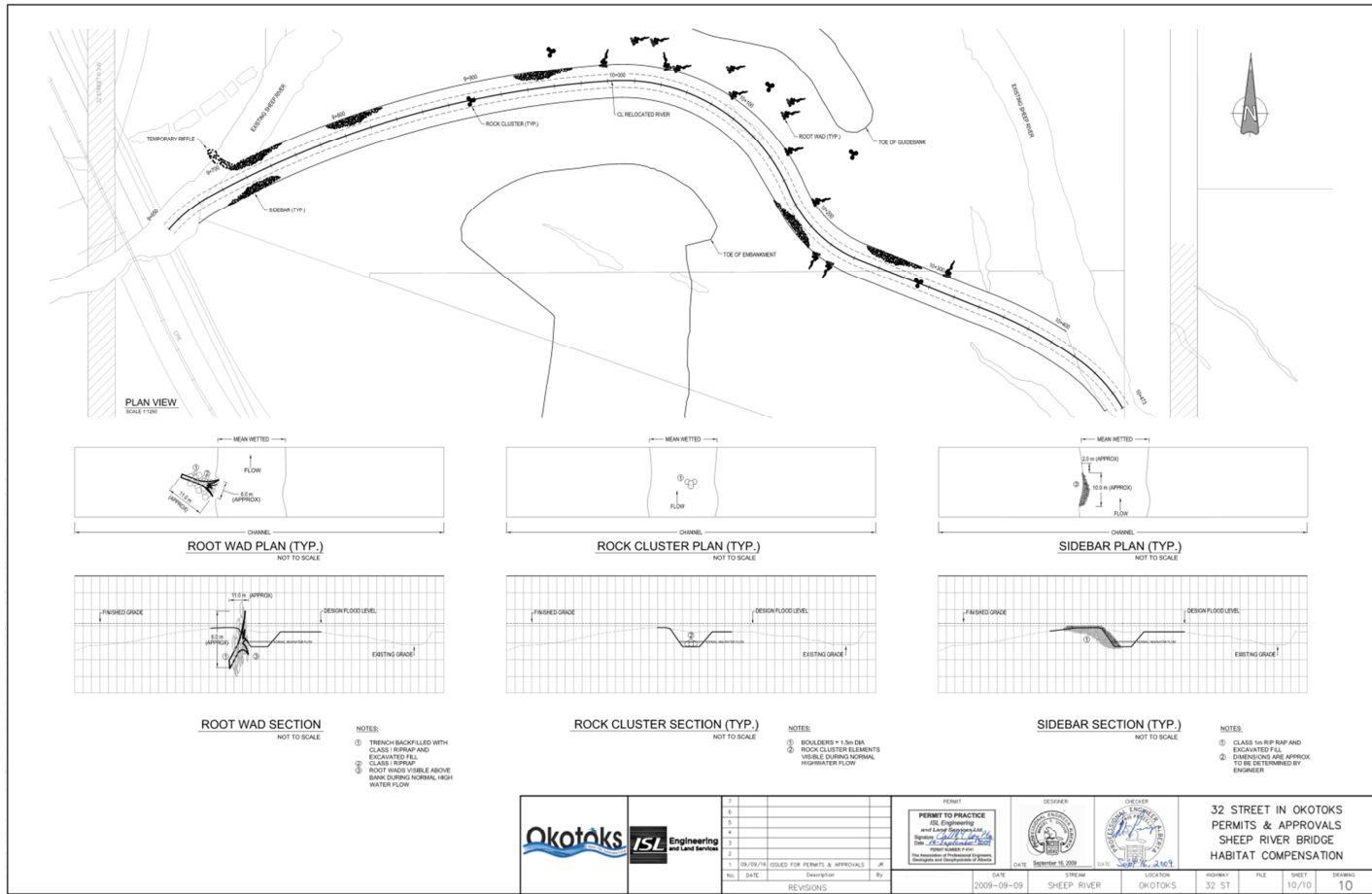
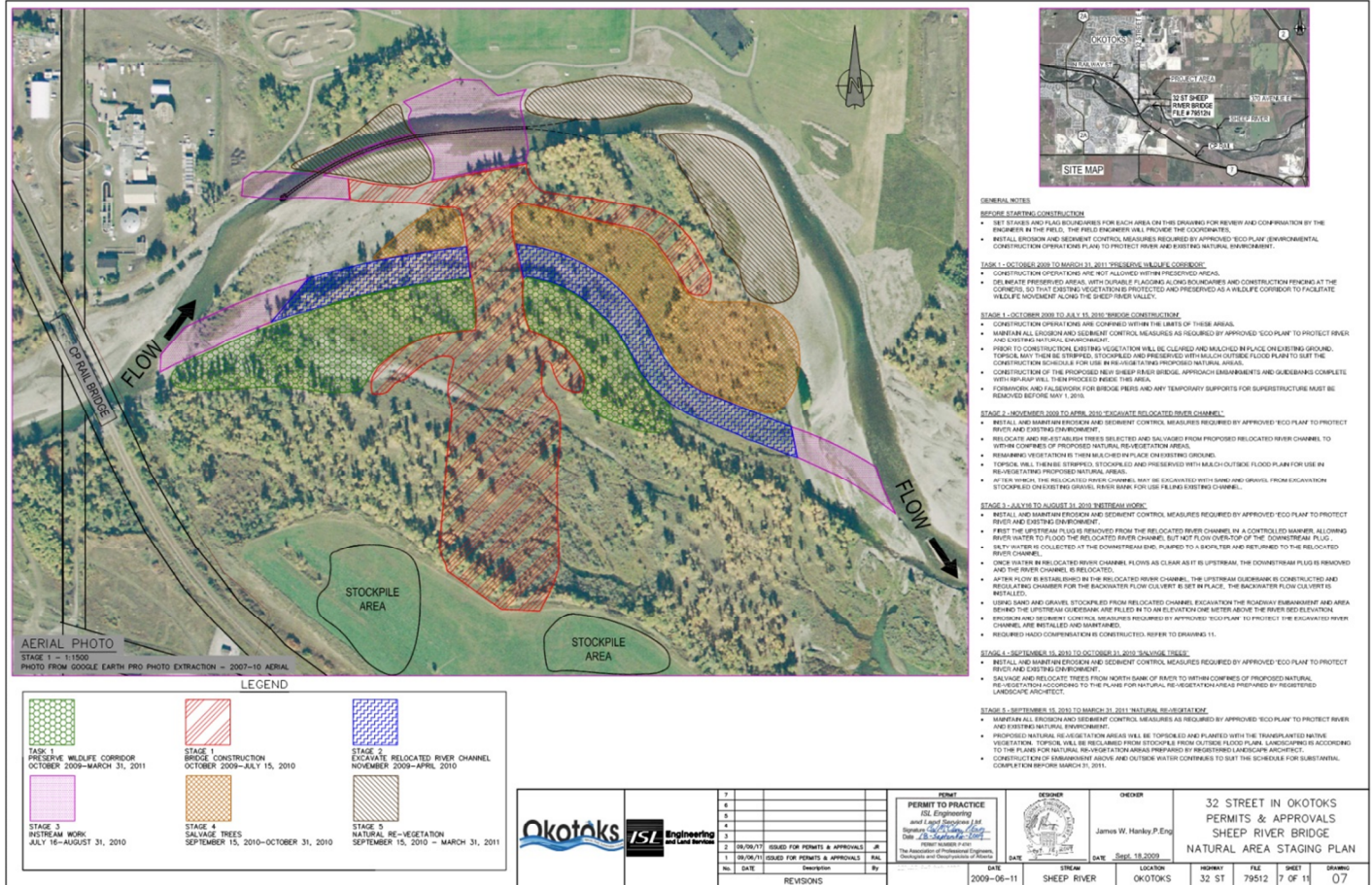


New Channel Fish Habitat Enhancement



Sheep River Diversion

Environmental Permitting



Sheep River Relocation



Sheep River Diversion, Upstream



New Sheep River Channel



Fish Salvage and Relocation



Fish Salvage and Relocation



Fish Salvage and Relocation



Fish Salvage and Relocation

2011 TAC Environmental Achievement Award Nomination



McAlpine (32 Street) Crossing - Sheep River Re-Alignment Project

Closure



Opening day, November 27, 2010



Opening day, Ceremony