

Meadow Way Bridge Chronology

2009- Caltrans obligated Highway Bridge Funding (HBP) funds for Meadow Way bridge; staff believes the Town did not pursue due to the lack of funds available to meet the matching requirement.

Early 2013/Mar. 2013 – CIC reminded staff of the funds for the Meadow Way and Creek Rd. bridges and the need to pursue the re-obligation of funding for Azalea and Bridge Preventive Maintenance Program (BPMP) bridges (Marin, Spruce, Canyon).

Staff issues an RFP for design and environmental services for Meadow Way, Creek, and BPMP bridges. Five firms responded to the RFP.

Sept. 2013- Town Council approved the master agreement with CIC for the Creek Rd. and BPMP bridges. The scope of work for the Meadow Way bridge was discussed and continued to the October meeting.

Oct. 2013- Town Council approved an amendment to the master agreement with CIC to include Meadow Way bridge.

Nov. 2013- The Town conducted a resident/community workshop regarding Meadow Way.

Jan. 2014 to Sept. 2015- During this 18 month period, staff and CIC were working with Caltrans to address key issues raised by the residents:

Can the bridge be constructed of wood?

Caltrans initially decided that the bridge cannot be wooden, but indicated that we could appeal the decision to the Federal Highway Administration (FHWA), who provides the HBP funds to Caltrans to administer. The Town did appeal and FHWA agreed to allow for wooden bridge.

Can the bridge be one lane?

Staff did have numerous discussions with Caltrans regarding a single lane bridge. Caltrans agreed that the Town can stripe the bridge to be one lane, but the bridge must meet the minimal FHWA width standards for bridges.

Can the existing bridge be rehabilitated and not replaced?

Caltrans stated that the rehabilitation of the existing bridge was not deemed feasible and would not be funded. CIC did discuss the preliminary concept with Caltrans. The “Do-Nothing” option, leaving the bridge alone was also deemed infeasible, as the existing bridge would only continue to deteriorate and, as the only inlet/outlet facility to the rest of Meadow Way, its deterioration and eventual collapse or shut-down would leave the residents stranded and threaten the various utilities servicing the neighborhood that are attached to the bridge.

2015-2016- From September 2015 through 2016, CIC worked on design and we conducted another community workshop to discuss design and other issues.

During this period, CIC also considered at least two other bridge types and examined a “drop-in” bridge. The “drop-in” bridge concept was suggested by a resident, even though a specific and detailed proposal had not been given to the Town. CIC contacted the prefabricated metal bridge’s manufacturer (Excel Bridge Company, also built the pedestrian bridge next to the Marin Road Bridge in town), which the individual had contacted, for more specifics on the concept. CIC has worked with this bridge company on other projects.

A simple drop-in bridge on top of the existing bridge does not work for a multitude of reasons: 1) the existing bridge may not be able to handle the weight, 2) the existing bridge is rapidly deteriorating and is not reliable for the long-term, 3) the drop-in bridge would have to ramped up and ramped down with an ADA slope of 5%, making the ramps about 40 feet long on each side of the bridge. This would block driveways and inhibit access to adjacent properties, 4) for reasons 1 and 2 above, the bridge needs to have its own structural support system (i.e., abutments); any new bridge at this location requires abutments, 5) the site has severe erosion and scour problems; the wingwalls are needed to protect the abutments and creek banks from erosion/scour, and 6) the site’s foundation soils are liquefiable during the Maximum Credible Earthquake (MCE), so deep foundations (drilled piles) will be necessary to prevent the bridge from catastrophic failure (i.e., collapse) during MCE.

Jan. 2017- Town Council approved the preliminary design for Meadow Way. The on-line survey conducted indicated the majority of Meadow Way residents wanted a concrete bridge. The Council authorized CIC to proceed with environmental analysis.

Jan. 2018- Staff provided an update on environmental analysis and proposed an alternative design for the retaining walls in the creek. The Council approved the change in the retaining wall design to a “half retaining wall half rip rap” to address neighborhood concerns and to be more environmentally friendly.

August 2019- Staff provided an update to the Council and reported that Caltrans approved the design change and additional funding for the revised design.

Project Costs

The total design, engineering, environmental, and communication efforts (i.e., website and emails) for Meadow Way Bridge is approximately \$1,030,000 plus \$29,000 is budgeted for CEQA costs that are not covered by the HBP grant.

The Town share of cost is 11.5% of design (\$118,000) plus \$29,000 for CEQA costs.

The estimate for final construction design is estimated to cost approximately \$310,000. The Town’s share will be approximately \$35,000-\$40,000. Total design/environment services cost is estimated between \$185,000- \$200,000.

Construction, Right-of-Way (ROW) such as temporary construction easements), and construction management costs are 100% covered by the HBP grant. Right-of-way negotiations, easements and mitigation to impacted properties is estimated to cost require another \$315,000 funding, but these are 100% federally funded and the Town has no shared obligation.

In general, bridge projects are complex and require the same design and environmental analysis as larger projects. All funding request must be reviewed and approved by Caltrans before the Town can incur expenses. For the Meadow Way bridge, we did request additional funding for public outreach and communications as well as for additional services required to address community concerns (e.g., ROW surveys and bridge design). We had to justify to Caltrans the need for every dollar above what they believed reasonable. Each time, Caltrans has agreed to the additional funding related to community concerns and scrutiny.

NOTE: These cost do not include the approximate \$90,000 the Town has spent to make temporary repair to the bridge to keep it accessible to heavy vehicles. We are waiting for the next Caltrans bridge inspection report for Meadow Way. We anticipate the Town will need to speed another \$25,000-35,000 for additional temporary repairs.

Project Status/Summary Prepared by CIC

Because of federal funds being administered through Caltrans, the project follows the rigorous federal and state standards of care for both its technical design and environmental processes. The CIC project team hired by the Town includes top professionals in various related fields to not only comply with the demands of this project, but go beyond the ordinary to deliver the most desirable bridge replacement to the community. The list of professionals includes not only innovative engineering, architectural and construction experts for a tough site; but local plant and animal biologists, including fish, bird and amphibious species experts; as well as creek hydrology, hydraulics and river sediment transport specialists.

In summary, the complexity of the site, to make the project compliant with federal and state technical and environmental constraints, and to make the project acceptable to the neighborhood, are multifold:

- The existing bridge is structurally deficient and substandard for traffic and pedestrian travel, having developed a pattern of fleeting safety behavior for travel soon after each annual repair in recent years.
- The bridge is built on a S-curve on the creek. The creek flows, however, like to go straight and cut through the westerly bridge end, especially at high stage flooding, and chip away at the west creek bank. The flows bounce back and forth in this stretch, gain higher local velocities, cause turbulence and severely scour and erode the opposite east embankment as well.
- The neighborhood desires comfort, quiet and maintenance of the natural environment. Some residents have an attachment to the existing bridge, while others want low-key but reassuring and safe public transportation amenities at this locale.
- The creek is spawning grounds and a migration route for steelhead, but no other species, threatened, endangered or otherwise, are present at this location.
- The bridge is a one-lane facility that will need to stay in service while it's being replaced. The physical site is tight and property line disputes have been abounding.
- Seismically, the site's soils are subject to liquefaction to approximately 50 feet below the roadway. Any structure, bridge or wall, would have to be on deep foundations. These are structural elements (footings) that would sit atop drilled piles that penetrate the viable soil layers below 50 feet from the top.
- The Town needs a nearly maintenance-free bridge that would last decades with minimal

additional expense to the Town.

With these challenges, it was obvious several issues needed to be kept in perspective in this project:

1. Maintaining convenience for users and residents, steady traffic flow, low impacts, high safety, as well as the acceptance of the road and bridge by the neighborhood would be important.
2. The replacement bridge would need to be constructed in stages, where traffic can utilize the existing bridge during construction.
3. Just replacing a deficient bridge will not be enough, but also addressing the two banks of the creek that are under assault by the flows and forces of erosion, supporting the bridge, will be required. Therefore, bank stability had to be addressed as well.
4. The crossing would have to be nature- and environmental-friendly and follow both state and federal environmental constraints.

After preliminary studies of various alternates for bridge replacement, including single-span crossings made of concrete, prefabricated steel or wood, the current concrete bridge option was selected by two-thirds of the neighborhood's vote. Also, for bank protection, the neighborhood selected conventional concrete walls, versus mechanically-stabilized embankments and/or "green" walls. Long-term cost and maintenance apparently played a large role in those selections by the neighborhood.

Because of the close proximity of the residences to the bridge and the tight right-of-way (ROW), the site imposes tough physical constraints for construction. From the environmental permits process point of view, it was evident the prudent assumption would be the contractor requiring a steep and narrow temporary access road to the creek from the top, while also being able to operate small cranes to lower or lift materials and equipment to and from the creek. Brief easement negotiations for the access road with the property owner, whose land extends over the bank and beyond their fence, have been positive throughout thus far. With this anticipated access road, the bridge, portions of its two abutments and two of its wingwalls will be constructed adjacent to the existing bridge first. Then, the traffic will be moved over to the new bridge, the existing bridge removed, the rest of the abutments and two short wingwalls constructed. Subsequently, in a one-night operation, the bridge is lifted (or hydraulically pushed sideways) a little over six feet to its permanent location in the middle of the ROW. This is when it can be reopened to traffic again, with the contractor concentrating on project wrap-up.

This stretch of San Anselmo Creek is wide and currently contains the maximum 100-year flows with ease. In the new project, the toe of the existing bank slopes will be kept where they are now, with the aid of bridge wingwalls and bank stability measures, so there is no additional encroachment on the creek bed. To boot, the waterway will be further opened up by removing the existing bridge's multiple supports, as well as a large, highly unstable and irregular concrete fortification at the toe of its east abutment in the creek. For this reason, the modeled 100-year creek flow elevations, up- and downstream of the site, will stay the same as now and local high velocities that cause increased erosion and scour are eliminated.

No right-of way take would be necessary for the project. Preliminary discussions with one property owner downstream of the project and away from the project, but one whose property extends to the northern edge of the bridge, have been positive. Here, either an easement or permanent dedication of a 15 to 20-foot strip of land adjacent to the new bridge for maintenance purposes is expected.

Preliminary discussions for temporary and permanent easements from at least two other property owners have also been positive. These property owners would receive benefits as a result of the project in terms of enhanced and stable embankments over to which their properties extend. There is no current formal access to the creek, except over an informal path down the creek that is steep, somewhat unsafe and an additional cause of bank erosion. In the preliminary discussions with one of the neighbors, owning the land where the temporary access road will be, agreement in principle has been reached to place a far less steep path there, specifically fortified and further stabilized with planting, at the end of the project. This agreement may be through a permanent easement for such an informal non-ADA path in perpetuity.

Environmentally, this will be one of the friendliest projects as far as various animal species are concerned. It will be constructed only during the dry season, running from July 1st to mid-November, the regulatory four and a half month non-spawning steelhead and coho salmon season. The latter species has been extirpated from the creek for nearly 30 years, but the project treats it as if it is still migrating up and down the creek during the wet season for spawning. No other plant or animal species is impacted by the project. The project will need to remove a cluster of bay trees at one quadrant and clear and grub the site from invasive plant species, including some Himalayan blackberries popular with some residents. All plants will be replaced with native plants, including California blackberry.

After the temporary access road is no longer needed, the creek bank there will be reconstructed as a revetment, consisting of large logs placed in horizontal grids, with one set of roots hanging over the edge of the waterway, the grids filled with boulders to 100 year flood level, and topped with natural soil to the top of the bank. (This is the project quadrant also targeted for the new footpath to the creek.) The revetment will be planted with willows and other native plants on top, projecting shade over the shallow pools in the creek where the log roots stick out. Not only does the project not eliminate fish-friendly pools and ponding at the site, if any, but perpetuates them in front of the revetment and throughout the site by regrading the creek bed into mini mounds and pools here. These, in combination with shade from the new plants and log roots, will be natural and friendly features for the spawning and migrating fish, lauded by Caltrans and NOAA Fisheries experts as elements contributing to a low-impact project that mitigates its effects.

There is no channelization of the creek at this site. The creek will remain wide open, with the structural elements on the edge of it being the bridge abutments and a wingwall at each of its four corners. The abutments and wingwalls have been minimized, with their foundations being buried 6 feet or deeper below the surface, topped with rock riprap for scour control, then topped by another three feet of native river bed. The resulting effect is a natural trough of river bed materials, terminating at the 50-year or so flood elevation at the walls and meandering through the site for proper fish migration..

Design and Construction Schedules, and Costs

With NEPA cleared and CEQA adoption being considered, the next project phase will include final design and ROW negotiations. This project's construction is a two-season undertaking because of its complexity and the short dry season of four and half months. CIC has proposed to Caltrans to conduct a quick study of certain extraordinary design and construction measures that may result in a one-season construction being possible. This study will be done during the next phase, once Caltrans

authorization is given. The town and CIC have planned a third public workshop later in 2020 to present the latest design, aesthetics, the results of this study and construction schedule to the neighbors and receive input.

It is anticipated this upcoming phase would take at least 12 months after Caltrans authorization, after which a period of advertisement, bidding and bid acceptance will ensue. The latter and Council's approval of the contract may take between 4-6 months. Because of these two upcoming phases, final design, ROW negotiations and bid periods, July 1, 2022 seems the most likely starting date for in-water work. Preparations and work at the street level may begin slightly earlier than July 1, 2022 and it is hoped the one-season construction would be deemed doable upon the conclusion of its investigation. If this is not the case, the site would be winterized by the contractor at the end of the first season and shut down, with work resuming by July 1st the following year to complete the rest.

The construction of the project will be 100% federally funded. The Town bears 11.5% of the cost of design and environmental studies (NEPA), as well as all of the CEQA costs, bringing the Town's total liability to about \$200,000 for the entire complex project (not including 100% of the cost of the repairs expended thus far.)