



Board of Supervisors Memorandum

May 13, 2014

Arroyo Chico, Final Construction Phase – High School Wash Project

Background

The Pima County-sponsored project with the US Army Corps of Engineers (ACOE), referred to as the Tucson Drainage Project, is locally known as the Arroyo Chico Project. This noteworthy and regionally beneficial project has a long project development history that spans more than 20 years. The attached June 28, 2013 memorandum (Attachment A) advised of the receipt of \$5.2 million in federal funding to complete the final phase of this project. That memorandum also provides a summary and review of the first two phases that have been constructed. The third and final phase is the subject of this memorandum.

The Arroyo Chico flood control project was conceived to address historical flooding challenges that have occurred in the Tucson area since development of the east and central portions of the City of Tucson with increased runoff from impervious surfaces on rooftops, roadways and parking lots. The project has already had the positive consequence of removing 1,315 homes and businesses from designated flood-prone areas and reducing individual household flood insurance costs by \$2,000 to \$3,000 annually. The relief from flooding has also allowed for increased economic development opportunities for businesses and industries removed from the 100-year floodplain; thus advancing the City of Tucson's economic vitality initiatives. The project plans and designs have also resulted in improved public and quasi-public facilities through:

1. Reconstruction of the Randolph South golf course to integrate flood storage capabilities with a more interesting and challenging municipal golf course (Phase 1);
2. Reconstruction and upgrading of baseball practice and interscholastic game facilities at Cherry Field (Phase 2A); and
3. Incorporation of flood detention basins into neighborhood recreational and riparian restoration facilities (Phase 2B).

The final phase of the project, referred to as the High School Wash project, is described in Attachment B. Its scope involves the construction of a large box culvert that provides for the collected drainage flows to be controlled through the developed area north of downtown Tucson and ultimately directs the flood flows to the Santa Cruz River. In the process of completing the delivery of Arroyo Chico detention basin flood flows, this project relieves the busy and developing Fourth Avenue business district from flood flow from this major drainageway. It also provides the benefit of assuring that the Modern Streetcar rail facilities and storage/maintenance building are not threatened with flooding.

Increased Cost from \$140,000 to \$1,269,739 to Provide Flood Control

As noted in the Phase 3 summary description, the project scope for the High School Wash portion was bid by the USACOE in 2010. At that time, the total project cost was \$1,791,000, with the federal share being \$1,181,000 and the local share to be contributed by the Regional Flood Control District (RFCD) of \$610,000. Advancement of the project was delayed only due to the unavailability of the federal fund share, which ultimately materialized during the current federal fiscal year as previously noted.

In recent months, the City of Tucson advanced the Modern Streetcar and Downtown Links transportation projects and requested that the scope of the High School Wash project be modified to respond to localized drainage concerns. A July 18, 2013 request from the City of Tucson included increasing the size of the planned box culvert drainage structure and the addition of various drainage inlets into the box culvert to provide for improved local drainage. Since the estimated cost for these improvements, as stated by the City, was approximately \$140,000. The RFCD confirmed its willingness to pay for the added cost as documented in its letter of July 30, 2013. We never anticipated the additional cost would ultimately be \$1.5 million.

The USACOE recently negotiated an updated contract price with the project contractor that was brought to the attention of the City of Tucson in a letter of April 15, 2014. As noted in this communication, the increased costs for the project require that the local sponsor increase its cost share, and the City of Tucson's requested portion of that cost share is now computed as \$1,269,739. The April 16 letter requested the City of Tucson's confirmation of their willingness to provide the additional cost contribution. An April 25, 2014 letter from the City of Tucson advised of their unwillingness to make any additional cost contribution. Attachment C contains my request to the Tucson City Manager. Attachment D is a letter of April 16, 2014 from the RFCD Director to the City of Tucson and the City's April 25, 2014 response. The City response claims credit for prior improvements that have been or will be constructed by the Regional Transportation Authority (RTA). It appears no City of Tucson funds will be spent for these improvements.

The City of Tucson's April 25 response fails to recognize the City of Tucson would have incurred significant additional costs to address both local and High School Wash drainage concerns without the advancement of the Arroyo Chico project by RFCD. This response also suggests Pima County retreated from its position of the funding the "betterment" costs associated with their requested changes. However, the original estimate of \$140,000 was provided by the City. The City's computed share is now \$1,269,739; thus, RFCD's requested financial contribution from the City is warranted.

Pima County Support for Downtown Area Development and Infrastructure

Pima County has continually been involved with the planning and implementation of downtown redevelopment efforts and individual project responses. In particular, the Regional Wastewater Reclamation Department has spent or will spend \$4.3 million on sewer line relocation and rehabilitation as shown on Attachment E. These projects involve the Modern Streetcar rail track facility installation in downtown streets. The Downtown Links project also requires the relocation of several sewer mains to accommodate the roadway widening and reconstruction. Further, the Rio Nuevo Area development will also require upgrading of a major interceptor sewer line that will be coordinated with planned redevelopment efforts. The County also rebuilt and expanded the sanitary sewer interceptor costing millions of dollars in anticipation of downtown development.

The other recent interaction with the City of Tucson involves Pima County's costs for waterline expansion, relocation and rehabilitation to support the soon to be completed Public Service Center (formerly known as the Joint Justice/Municipal Courts Complex). The County costs for this waterline work totaled nearly \$812,000. As I have previously communicated to the Board, Pima County and the City of Tucson are engaged in a contentious discussion of the justification for the imposition of such costs; and we are proceeding with a legal claim to recover a portion of these costs. This construction cost was incurred by Pima County during the unsuccessful partnership with the City to jointly fund a combined County/City courts facility. Finally, we are very concerned that the waterline costs incurred by the County will likely be significantly reconstructed again, now using RTA funding to extend a storm drain and associated improvements to and through the intersection of Stone and Toole Avenues.

Conclusions

Discussions of the final phase of the Arroyo Chico project with the City of Tucson have prompted a review of various infrastructure projects of interest to both entities. The conclusions resulting from our review of these projects are as follows:

1. The Arroyo Chico flood control project is a beneficial regional project that has resulted in a total investment of federal and local funds in excess of \$60,000,000. The constructed improvements have or will provide flood relief for major portions of the central portion of the City and have also produced upgraded public and quasi-public facilities. The High School Wash improvements are the final improvements needed to complete this major project.
2. In abiding by the traditional USACOE project agreement requirements, the locally requested "betterments" are not eligible for federal funds and must be paid for by the requesting local entity; in this case, the RFCD.

3. Federal flood control project funds are in limited supply, and the final phase of the Arroyo Chico project is the only such project in the State of Arizona that was funded this fiscal year.
4. The City of Tucson has declined to provide financial cost-sharing for the project improvements they requested and have instead claimed credit for RTA improvements.
5. Pima County and the RFCD intend to preserve their valued working relationship with the USACOE and will honor our commitment to complete this project.

Recommendations

Given the circumstances described previously, I recommend the Board of Supervisors take the following actions:

1. Authorize the Regional Flood Control District to pay the betterment costs requested by the City of Tucson by approving payment in the amount of \$1,500,000 to the US Army Corps of Engineers as provided for in Resolution No. 2014-____ (Attachment F). Funds are available for this purpose, and no other project will be adversely impacted by this action.
2. Since our experience with the City of Tucson on this and other recent projects has not been conducive to a collaborative partnership, direct that any future proposals for similar cost arrangements be reviewed in depth and that Pima County will not enter into agreements with third parties that include City of Tucson participation, unless and until legally-enforceable written agreements for jurisdictional contributions are in place.
3. Request that the Regional Transportation Authority consider reimbursing the Regional Flood Control District for these costs as this particular project is critically important to the overall Downtown Links project.

Sincerely,



C.H. Huckelberry
County Administrator

CHH/mjk – May 6, 2014
Attachments

c: John Bernal, Deputy County Administrator for Public Works
Suzanne Shields, Director, Regional Flood Control District

ATTACHMENT A



MEMORANDUM

Date: June 28, 2013

To: The Honorable Chairman and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator 

Re: Tucson Drainage - Arroyo Chico Project Federal Funding For Project Completion

Pima County has been informed by the U.S. Army Corps of Engineers (Corps) that \$5,251,472 has been funded for completion of the Arroyo Chico project in the upcoming fiscal year. This is the only project in Arizona to receive funding for Fiscal Year 2013. The Corps recognizes how critical this project is to provide flood control for the Tucson downtown urban area.

This final phase of the project will include channel improvements to the Arroyo Chico between Campbell to Parkway Terrace in a business/commercial area and storm drain improvements to High School Wash from 3rd Avenue and 8th Street that will provide protection to Tucson High School and the 4th Avenue business area.

Regional Flood Control District and the City of Tucson in cooperation with the Corps undertook this multi-phase flood control, environmental restoration and recreation project in 1996. The project area encompasses approximately 6 miles of the Arroyo Chico (also known as Tucson Arroyo) Wash from Alvernon Way to its confluence with the Santa Cruz River near St. Mary's Road. The phases of the project that have already been completed are:

- Phase 1, Randolph South Detention Basins at the Dell Urich Golf Course which were completed in April 1996 at a cost of \$13,000,000;
- Phase 2A, Cherry Field Detention Basin which was completed in December 2008 at a cost of \$23,000,000; and
- Phase 2B, Park Avenue Detention Basin Complex has recently been completed at a cost of \$18,000,000.

The Arroyo Chico/Tucson Arroyo and its tributaries -- High School Wash, Railroad Wash, Citation Wash, Paseo Grande Wash and Naylor Wash -- drain an area of 11.4 square miles located in central and downtown Tucson. These ephemeral watercourses drain a watershed which is fully developed and contains a mix of residential, commercial and industrial areas. A segment of the lower watershed main channel is conveyed through an underground two-barrel, 10 feet wide by 8 feet high concrete box culvert for approximately 1.7 miles that was originally constructed in the 1920's. Because of the increased runoff due to urbanization of the contributing watersheds, the capacities of the open channel/culvert sections were

inadequate to convey the peak flows caused by intense thunderstorm events, resulting in frequent and severe flooding of residential, commercial and industrial areas along the entire length of the arroyo.

Significant regional benefits of this project include:

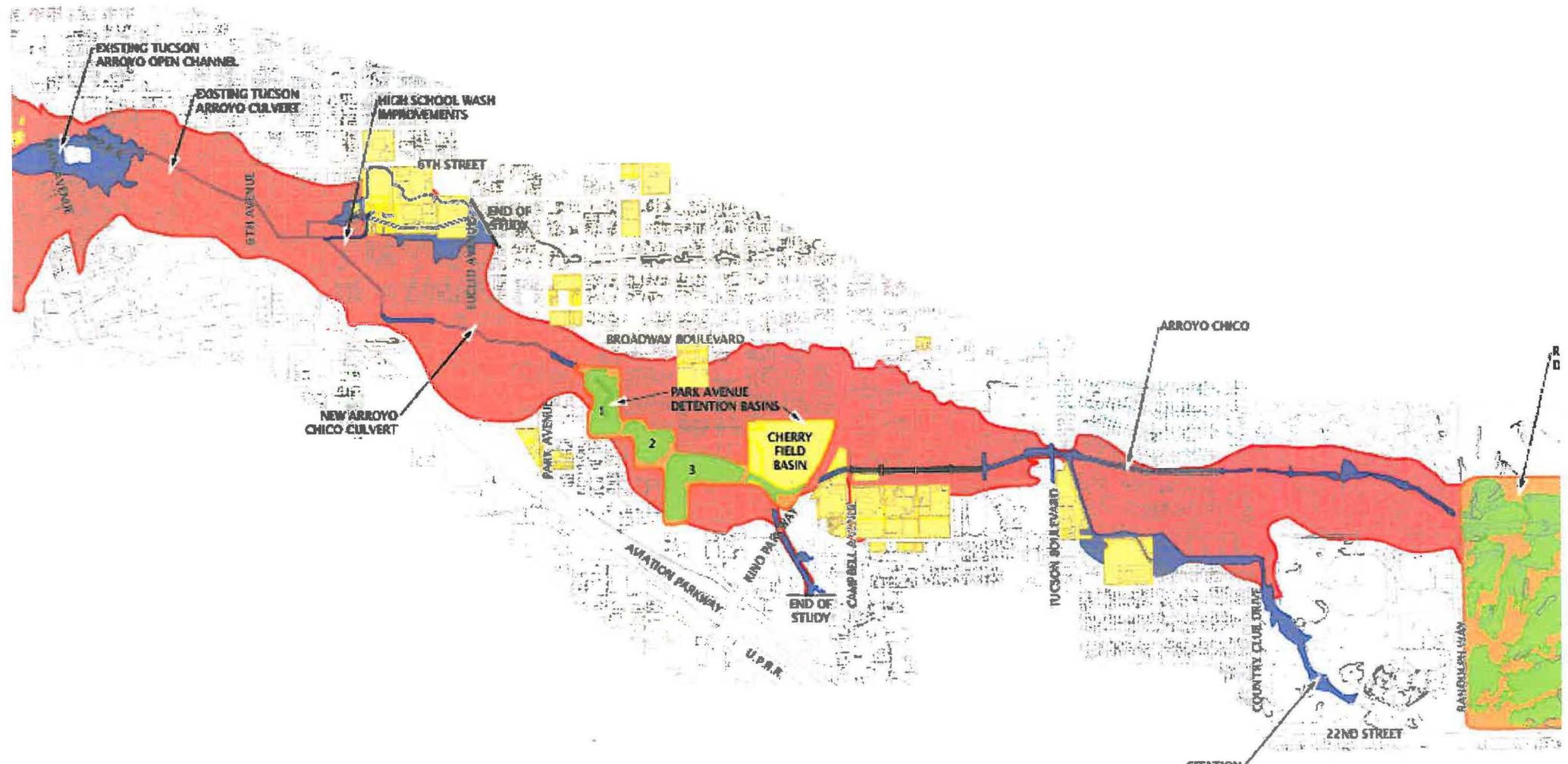
1. Removal of 1,315 residential, multi-family, commercial, and industrial structures from the FEMA 100-year floodplain with a total assessed property value of \$364,758,000. Residential structures removed from the FEMA 100-year floodplains would save individual households \$2,000 to \$3,000 annually in flood insurance costs for a total annual savings of about \$2,420,000.
2. Removal of 71 publicly owned parcels (not reflected in assessed value) including 3 schools and the maintenance and bus yard for Tucson Unified School District.
3. Increased economic development opportunities for businesses and industries in areas removed from the FEMA 100-year floodplain within the federally designated empowerment zone created to revitalize the Tucson economy.
4. Reduction in flood repairs and inundation costs to the public infrastructure of \$2,070,000 annually by providing flood control protection to:
 - Union Pacific Railroad, 1.26 track miles
 - Interstate 10 corridor and 4.6 miles of local major streets
 - The Tucson Modern Streetcar storage facility and route
 - State Route 210, the Barraza–Aviation Parkway through downtown Tucson

The County has a very beneficial partnership with the Corps of Engineers and we appreciate their steadfast assistance in completing this most important flood control project benefitting the region and City of Tucson.

CHH/dr

Attachments

- c: The Honorable Ron Barber, Member, United States House of Representatives
The Honorable Raúl Grijalva, Member, United States House of Representatives
Colonel R. Mark Toy, Los Angeles District Commander, US Army Corps of Engineers
The Honorable Jonathan Rothschild, Mayor, City of Tucson
The Honorable Richard Fimbres, Councilmember, City of Tucson
The Honorable Steve Kozachik, Councilmember, City of Tucson
John Bernal, Deputy County Administrator for Public Works
Suzanne Shields, Director, Regional Flood Control District

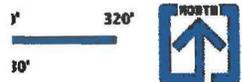


LEGEND

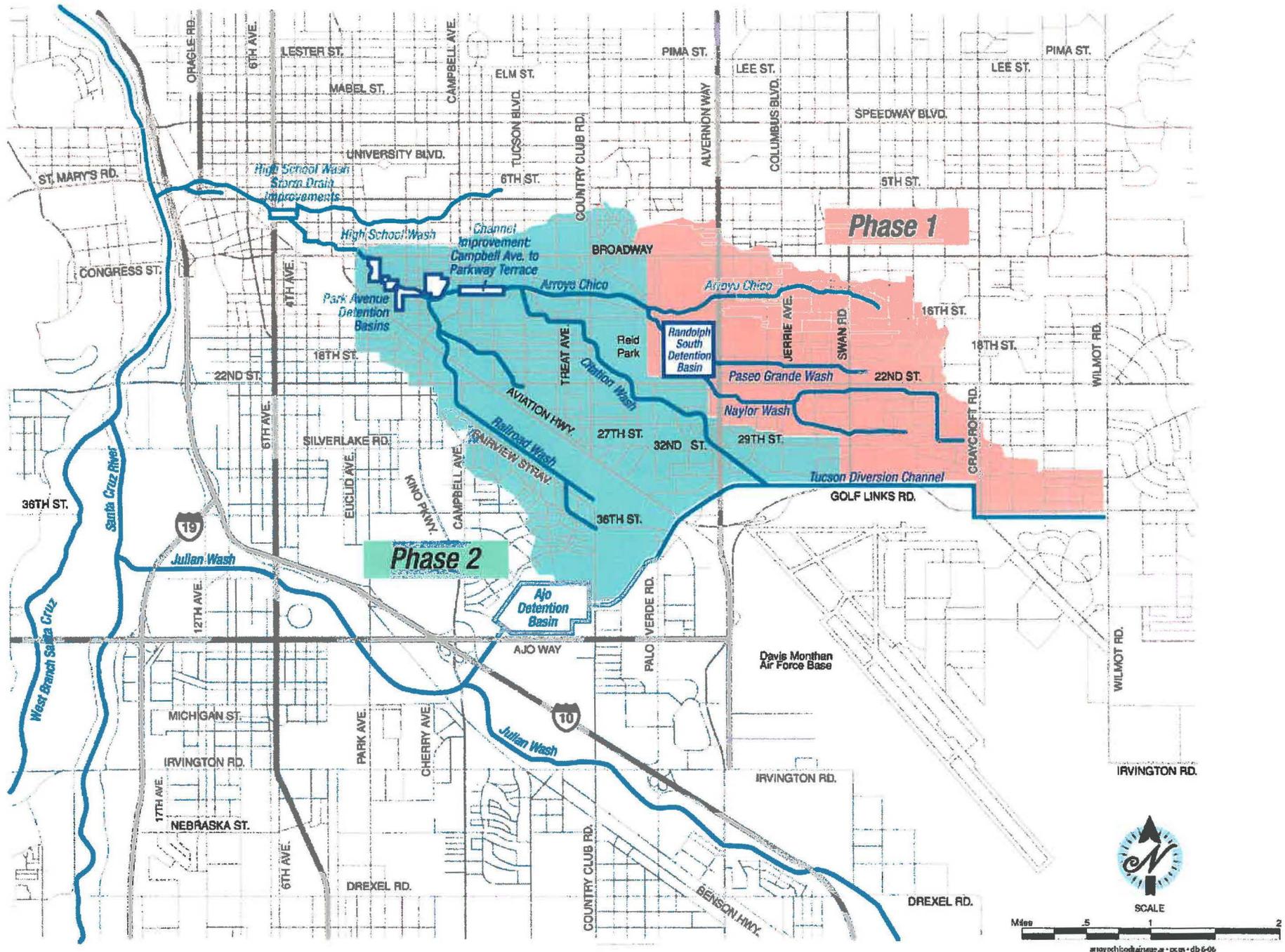
- PRE-PROJECT 100-YEAR FLOOD LIMITS
- WITH-PROJECT 100-YEAR FLOOD LIMITS
- WITH-PROJECT 100-YEAR FLOOD DETENTION BASIN WETTED AREA
- FLOOD CONTROL DETENTION BASINS
- TUCSON UNIFIED SCHOOL DISTRICT SITES



Imp



Tucson Drainage Area • Arroyo Chico



ATTACHMENT B

ATTACHMENT B

U.S. Army Corps of Engineers Tucson Drainage Project (Arroyo Chico)

Phase 3

PHASE 3 – HIGH SCHOOL WASH

2010 as-bid project was to provide 896 linear feet of new 10'x8' concrete box culvert at a construction cost of \$1,791,000. The City had requested an additional street storm drain to completely remove the area from the 100-year floodplain. The Corps has revised the construction document to reflect this betterment request and negotiated a construction modification with their contract. During the time between the bidding and start of construction, the permits for the water and wastewater line modifications expired requiring additional design modifications to meet current standards. The modifications include the updated plans and the project construction costs now stand at \$4,281,419.00.

US Army Corps of Engineers

- Responsible for the design, construction, and construction administration and inspection of project phases.
- Federal contribution available for remainder of project \$5,521,476. This includes funding for construction administration, inspection; landscape establishment and project close out.

City of Tucson

- Designed and constructed artificial turf area for Tucson High School football field at an estimated cost of \$750,000 per the IGA.
- Conveyed former city streets and alley (Parcel #117-05-002) at Tucson High School field and stadium to TUSD.
- Responsible for operating and maintaining the High School Wash and 8th Street storm drain system per the IGA.
- Extended 8th Street storm drain approximately 75 feet as part of 8th Street Drainage and Downtown Links project. This will save the Corps approximately \$187,000 in additional 12'x 8' box culvert construction and traffic control issues associated with 4th Avenue and the Modern Street Car track.

Regional Flood Control District

- Funding for the initial betterment design. Payment of \$147,755 was sent on November 4, 2013.
- Funding for anticipated betterment construction based on the Independent Government Estimate. Additional payment of \$651,427 was sent on January 7, 2014.
- The Corps requested an additional \$1,269,738 based on negotiated modifications for betterments with their contractor. Response to be determined by the Board of Directors.
- At the conclusion of the project, the District and the Corps will determine the final cost of all cost share amounts and contributions. The information provided above will assist in that analysis, but the numbers provided are our best estimate of those costs at this point in time.
- In addition, Mr. Elias's response letter documents the City's expenditures for drainage

improvements recently constructed for the Downtown Links Project.

- The District supports the betterment request to complete the final phase of this major flood control improvement.

ATTACHMENT C



COUNTY ADMINISTRATOR'S OFFICE

PIMA COUNTY GOVERNMENTAL CENTER
130 W. CONGRESS, FLOOR 10, TUCSON, AZ 85701-1317
(520) 724-8661 FAX (520) 724-8171

C.H. HUCKELBERRY
County Administrator

April 15, 2014

Richard Miranda, City Manager
City of Tucson
P. O. Box 27210
Tucson, Arizona 85726-7210

Re: City of Tucson Financial Participation in Arroyo Chico Final Construction Phase for High School Wash

Dear Mr. Miranda:

The Pima County Regional Flood Control District is nearing final contract approval with the US Army Corps of Engineers (Corps) over the final phase of the High School Wash box culvert, which will complete the Arroyo Chico Flood Control Project.

We were asked by the City of Tucson, in a letter dated July 18, 2013, to make a number of modifications and substantial benefits to the proposed project. The City's July 18, 2013 letter request is attached.

At the time, the proposed betterments were estimated by the City to cost \$140,000. The original project plans bid by the Corps' contractor, Hunter Contracting, consisting of an 8-foot by 10-foot box culvert, was \$1,791,000. The additional cost to fund the City requested betterments is \$1,269,739.

I will be placing this additional cost as an option for the Regional Flood Control District Board of Directors to consider at their meeting of May 6.

We would request the City's financial participation in this excess cost, since the request was made by the City of Tucson.

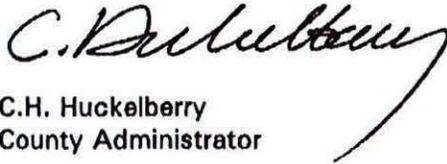
Mr. Richard Miranda

Re: City of Tucson Financial Participation in Arroyo Chlco Final Construction Phase for High
School Wash

April 15, 2014

Page 2

Sincerely,



C.H. Huckelberry
County Administrator

CHH/mjk

Enclosure

c: John Bernal, Deputy County Administrator for Public Works
Suzanne Shields, Director, Regional Flood Control District



MEMORANDUM

Date: April 15, 2014

To: Suzanne Shields, Director
Regional Flood Control District

From: C.H. Huckelberry
County Administrator 

John Bernal, Deputy County
Administrator for Public Works

Re: **Betterment Costs Associated with the High School Wash US Army Corps of Engineers Project**

I appreciate our recent discussion regarding this project.

I would like to know what caused the increase in the size of the box culvert from 8 feet by 10 feet to 10 feet by 12 feet and why this is considered a betterment. What would be the result if we went back to the 8 by 10 box culvert? Obviously, it would have less flood water conveyance capacity; but if the US Army Corps of Engineers' (Corps') base design indicates such a facility would work, why are we now constructing a 10 foot by 12 foot box culvert?

As I indicated to you, the increased cost will be difficult, particularly due to the lack of City of Tucson participation in this project, as well as in other major public works projects where they have not reimbursed the County their fair share of costs.

Please ensure the Corps does not proceed with this project until the Board of Supervisors has actually improved the increased betterment costs.

CHH/mjk

c: William Zimmerman, Deputy Director, Regional Flood Control District



**PIMA COUNTY
REGIONAL FLOOD CONTROL DISTRICT**
97 EAST CONGRESS STREET, THIRD FLOOR
TUCSON, ARIZONA 85701-1797

**SUZANNE SHIELDS, P.E.
DIRECTOR**

**(520) 243-1800
FAX (520) 243-1821**

July 30, 2013

Daryl Cole, Director
City of Tucson, Department of Transportation
P.O. Box 27210
Tucson, AZ 85726-7210

Subject: High School Wash Betterments

Dear Mr. Cole:

We will be happy to include the request for improvements noted in your July 18, 2013 letter. We share the City's goal to alleviate flooding in the Fourth Avenue business area. My staff will be working with HDR and the U. S. Army Corps of Engineers to see that these improvements are added to the project with the District providing the necessary funding.

Once the project is completed we will also process revisions to the floodplain maps through the Federal Emergency Management Agency.

Sincerely,

A handwritten signature in blue ink, appearing to read "S Shields".

Suzanne Shields, P.E.
Director and Chief Engineer

SS/tj

c: Albert Elias, Assistant City Manager
Fred Flex, Interim Engineering Administrator – City of Tucson DOT
Sam Credio, Project Manager – City of Tucson DOT
Bill Zimmerman, Deputy Director – Regional Flood Control District
Larry Robison, Division Manager – Regional Flood Control District

RECEIVED
JUL 30 2013
RFGD



CITY OF
TUCSON
DEPARTMENT OF
TRANSPORTATION

July 18, 2013

Suzanne Shields, P.E., Director
Pima County Regional Flood Control District
97 East Congress Street
Tucson, Arizona 85701-1797

Subject: High School Wash Betterments

Dear Ms. Shields:

The Tucson Department of Transportation respectfully submits this request for Pima County Regional Flood Control District to provide funding in the amount of approximately \$140,000. The City would like to add improvements to Increment 4 of the pending Army Corps of Engineers drainage project that will reroute the High School Wash, to alleviate flooding in the Fourth Avenue area. Despite these proposed improvements, it is expected that approximately 600 cfs will bypass this new feature and continue on to Fourth Avenue. County engineers and HDR have proposed additional improvements that would intercept this break-out flow to ensure the Fourth Avenue businesses can be removed from the 100-year floodplain. These improvements are as follows:

1. Increase the box culvert size from 10' X 8' to 12' X 8'. The cost for this has been offset since the City built an additional 95 feet of this box during the recent Eighth Street culvert project so that the Corps would not need to disturb Fourth Avenue nor reconstruct the Modern Streetcar tracks with the Segment 4 construction. (Tetra Tech is designing this modification and the difference in construction cost is not currently known).
2. Build a large grated inlet over the top of the existing High School Wash culvert at the location of the existing small inlet on the TUSD campus. A short wall or berm would be built along the west side of the campus to ensure the flow enters the inlet. (Approximate Cost is \$35,000).
3. Build a pair of curb-opening inlets on Eighth Street just east of Third Avenue that outfall into the new box culvert. (Approximate Cost is \$43,000).
4. Build a pair of curb-opening inlets on Eighth Street just west of Third Avenue that outfall into the new box culvert. (Approximate Cost is \$21,000).

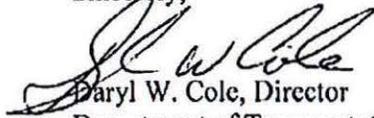


5. Build a pair of curb-opening inlets on Third Avenue just north of Eighth Street that outfall into the new box culvert. (Approximate Cost is \$39,000).

The City of Tucson understands that these would be considered betterments and therefore not eligible for ACOE funding. Given the long history of these flood control project and past flooding problems that have impacted the Fourth Avenue businesses, we believe this is a wise investment to ensure that the area is dried up once and for all.

In advance, we appreciate your consideration of this request. If you or your staff have any questions, please have them contact Mr. Sam Credio of my staff, at 837-6641.

Sincerely,


Daryl W. Cole, Director
Department of Transportation

DC/AM/rw

c: Albert Elias, Assistant City Manager
Fred Felix, Interim Engineering Administrator
Sam Credio, Project Manager
Larry Robison, PC RFCDD

Downtown Links

Offsite Drainage Analysis

Submitted to

City of Tucson Department of Transportation
Engineering Division

by

HDR Engineering, Inc
5210 East Williams Circle, Suite 530
Tucson, Arizona
HDR No. 30210

December 30, 2010



Expires 06-30-2012

A3 -- 7TH STREET / 3RD AVENUE INTERSECTION

Thread 1, that being the flow southward in 3rd Avenue from 6th to 7th Street, is first evaluated. The total discharge reaching the 7th Street intersection is 108.8 cfs. A grated catch basin consisting of two rows of Neenah 1.9 grates will capture all but 11.5 cfs of that amount. The carry-over will continue southward in 3rd Avenue to the existing catch basins at High School Wash.

At some point it may become desirable to "dry up" High School Wash between 3rd and 4th Avenues. The replacement culvert report notes that it will be necessary to prevent 8th Street flow from breaking over into the Tucson High School campus to do so. The 8th Street catch basins are sized to accept the entire 8th Street flow as described in that report. It will also be necessary to provide an alternative means of draining the 3rd Avenue sump at High School Wash. Preliminary calculations indicate that this is best accomplished by removing the existing High School Wash culvert under 3rd Avenue and installing instead catch basins at the low points on either side. The catch basins would be drained by a new 36" RCP approximately 140' in length extending to the 7th Street storm drain in the 7th Street intersection. The 36" diameter provided more capacity than indicated by the hydrologic analysis here but is suggested in light of the problematic nature of the split flow analysis at the 3rd Avenue/6th Street intersection on which the hydrologic analysis depends. A plausible future catch basin and storm drain configuration to accomplish this is indicated in the intersection diagram A3 of Appendix E. The approximate storm drain capacity calculation is provided on page 1 of Appendix D.

A4 -- 3RD AVENUE AT HIGH SCHOOL WASH

The southward flow from 7th Street plus the immediately tributary area results in a total flow of 52.4 cfs at the sump in 3rd Avenue over High School Wash between 7th and 8th Streets. This is the amount that will enter High School Wash and would need to be accounted for if High School Wash were to be abandoned in the future. This relies on the flow at B3 being accommodated as discussed below. Any of that flow that is not accounted for at that location would overflow to A4.

B1, B2 -- NEW GRATE INLET ACROSS 8TH STREET

These catch basins and their associated storm drain are considered to be governed by regional flow conditions (the High School Wash breakout at Euclid) and are addressed in the replacement culvert report.

B3 -- NEW GRATE INLET WITHIN THIS CAMPUS

The peak flow generated within the THIS campus results in a total discharge of 141.8 cfs. This flow accumulates in a slightly depressed athletic field south of the football field. A small catch basin currently drains this area to the existing High School Wash RCBC under Tucson High. Discharges exceeding the capacity of this inlet currently overflow westward into 3rd Avenue.

As a part of its Park Avenue detention basin construction, the U.S. Army Corps of Engineers plans to reroute the culvert through this field to the Tucson Arroyo culvert at 4th Avenue and 8th Street. To prevent overflow into 3rd Avenue, it is proposed that a grate inlet consisting of a 4 x 3 array of EF-1 grates (or equivalent) be constructed into the top of the relocated culvert to capture the full amount of flow. It is also proposed that the new single-cell culvert proposed by the USACE be increased in size from 10' x 8' to 12' x 10' to keep the hydraulic grade line below the surface.

This configuration is indicated in diagram B3. Some slight re-grading of the field necessary to create positive drainage to the new inlet would not affect its athletic function. A low berm and wall only a foot or so in height along the west edge would contain the 100-year storm within the field without affecting its athletic function.

C0. -- 6TH STREET AT 4TH AVENUE

The flow continuing westward in 6th Street from 3rd Avenue joins a sizeable tributary area to create a flow of 145.6 cfs at the 6th Street/4th Avenue intersection. As at 3rd Avenue, this flow splits with components continuing westward toward 5th Avenue and southward in 4th Avenue. The southward flow was found earlier to split between the east and west sides of 4th Avenue, that divide being determined in the split flow analysis as well.

Diagram C0 shows the various components of flow occurring in a 100-year storm. It can be seen that the bulk of the flow, 91.4 cfs is confined to the east side of 4th to 7th Street where existing catch basin C1 is located. A substantial amount of flow, 34.0 cfs, is distributed to the west side of 4th Avenue where it flows south to 7th Street and then east to 5th Avenue to CB E2. A smaller amount, 20.3 cfs continues westward in 6th Street to 5th Avenue where it turns southward to CB E1. The calculations for CBs E1 and E2 are discussed below.

C1-C4. -- 7TH STREET AT 4TH AVENUE

Catch basins C1, C3, and C4 are existing Type 3 catch basins with two 16' wings configured as seen in diagram C1-C4. C2 is a new catch basin, also with two 16' wings, intended to capture the westward flow in the north half of 7th Street. It is relatively inexpensive in that it will tie directly into the new 7th Street storm drain, and will substantially reduce flooding in 4th Avenue between 7th and 8th Street.

The discharge for C1 is the flow breaking southward from C0 in the east side of 4th Avenue plus the tributary area downstream of that point. The total 100-year flow Q_T is 95.1 cfs. The existing catch basin provides a large curb opening but even so is only able to capture about 60% of this amount. The remainder crosses 7th Street to CB C4. CB C1's performance is hampered by the relatively steep longitudinal grade of 1.77% as well as the large discharge involved.

The design discharge for CB C2 is based solely on its directly tributary area thanks to CB A3 which prevents any flow breaking westward from 3rd Avenue. It also is located on a relatively steep longitudinal slope and unable to intercept the entire 21.2 cfs. A relatively small amount, 4.9 cfs, will carry over to CB C4.

CB C3 is subjected to a very small discharge which it is easily able to handle.

CB C4 is subjected primarily the carry-over from CB C1 and C2 which together with the small tributary area produce 44.0 cfs. With a flatter longitudinal slope, this existing catch basin captures 36.0 cfs, leaving 8.0 cfs to carry-over to CB 5.

C5 -- EAST SIDE OF 4TH AVENUE MIDBLOCK BETWEEN 7TH AND 8TH STREETS

The carry-over from C4 moves on to a series of curb inlet catch basins referred to collectively here as CB C5. The total opening length of this cluster is 40'. It is located in a sump on the east side of 4th Avenue midblock between 7th and 8th Streets. Assuming the upstream inlets fully functional, the additional directly tributary area increases this flow to 10.3 cfs resulting in a ponded depth at catch basin inlets of

0.29'. With the average invert elevation of the inlets being 2379.37, the corresponding water surface elevation is 2379.66. Examining the diagram C5 and C6 shows the approximate sidewalk elevation fronting the adjacent shops to be about 2380.1 indicating this flow will be contained within the curbs.

WITHOUT NEW 7TH STREET STORM DRAIN

The above calculations for C1-C4 and C5 are based on the new 7th Street storm drain in place. That storm drain performs two important functions regarding flooding in 4th Avenue--(1) it along with CB A3 prevents a large westerly component of split flow at the 3rd Avenue/7th Street intersection from reaching the 4th Avenue/7th Street intersection, and (2) it allows catch basins C1-C3 to function at their normal capacity. Their collective capacity is otherwise constrained by the capacity of the single 36" RCP draining them which is only 39.2 cfs. The combined capacity of their inlets is 113.6 cfs by comparison.

Without the new storm drain, the flow reaching CB C5 is the total flow from the tributary area less that splitting westward in 6th Street at C0 (SF # 1), that splitting southward in 3rd Avenue at 7th Street at A3 (SF # 1a), and the capacity of the existing storm drain. The resulting discharge is 163.8 cfs compared to the 10.3 cfs found above with the new storm drain in place. The ponding depth at that discharge would increase from 0.29' to 1.87'. The resulting water surface elevation would increase to 2381.24. Diagram C5,C6 indicates floor elevations of adjacent shops to be around 2380.1, more than one foot below this water surface elevation.

Without the 7th Street storm drain flooding will continue to be experienced along this reach of 4th Avenue. Having the Park Avenue basins and the replacement culvert in place will not in itself improve this situation.

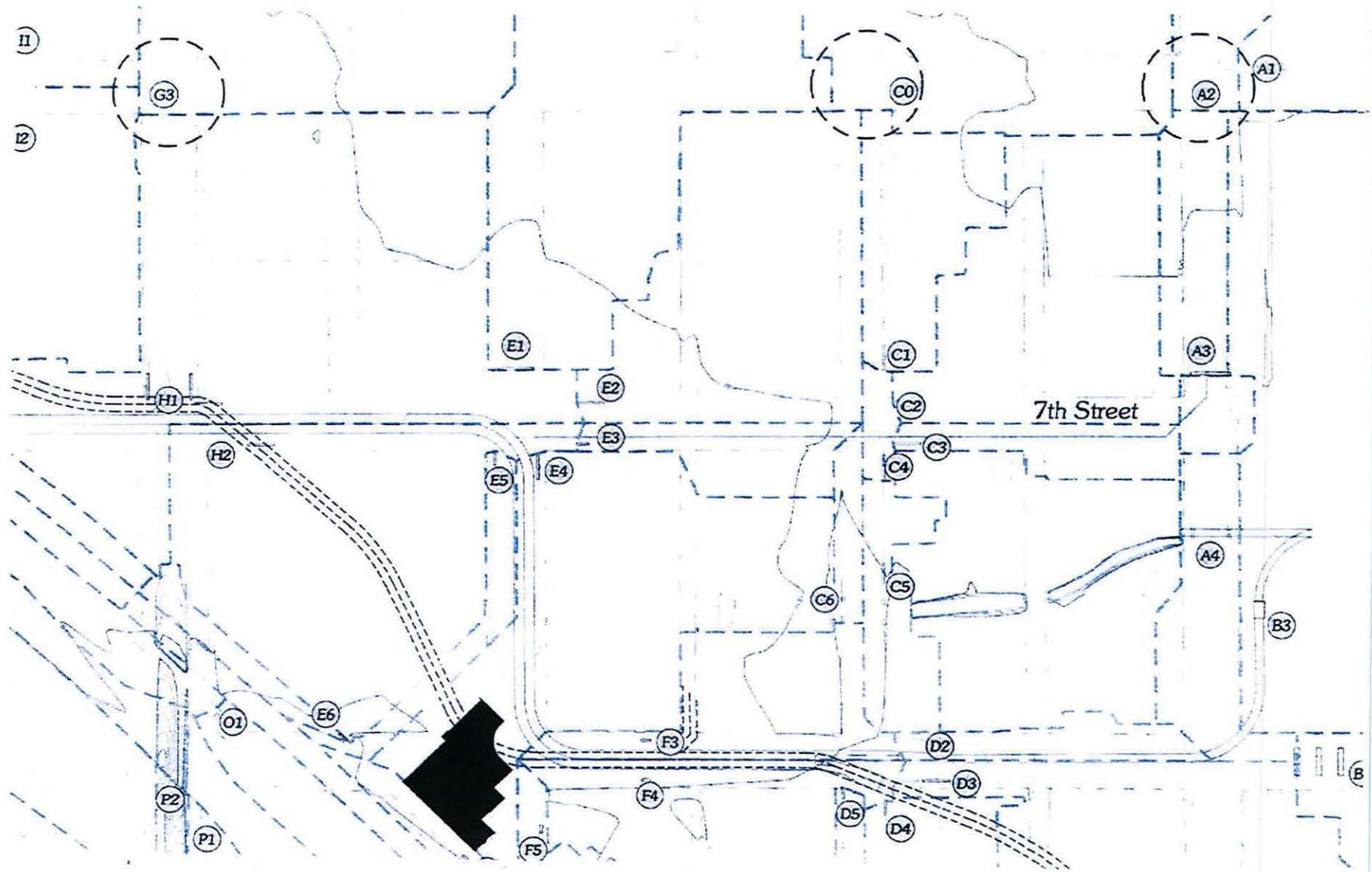
C6. -- WEST SIDE OF 4TH AVENUE MIDBLOCK BETWEEN 7TH AND 8TH STREETS

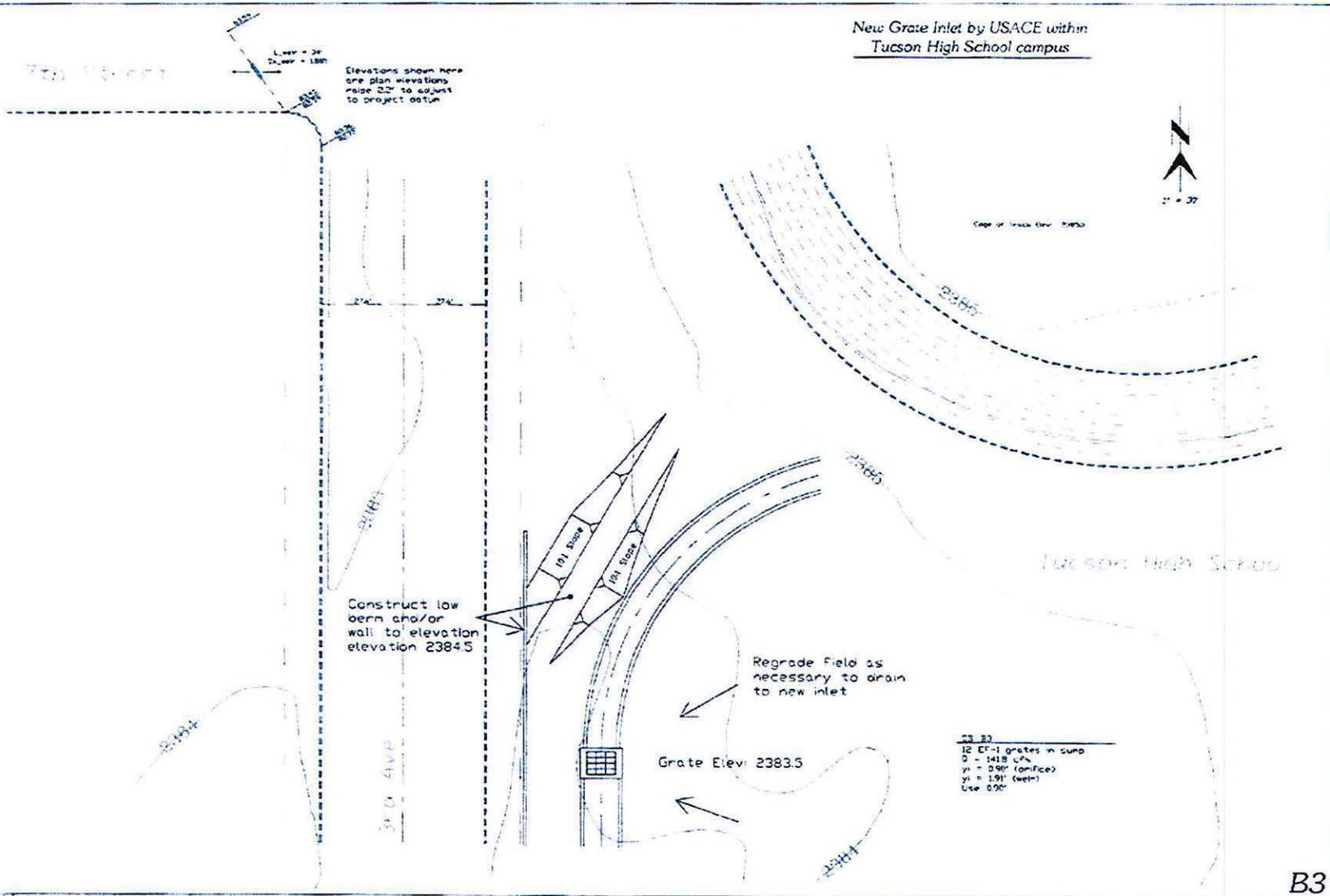
The calculations anticipate only the directly tributary area which produces only 5.9 cfs. Three existing grate inlets on grade will intercept about 4.5 cfs, leaving 1.4 to continue on southward and then westward in 8th Street to F3. This amount is small and ignored for the purpose of sizing CB F3. This will need to be re-examined if the breakout across 4th Avenue is not resolved.

D. -- 8TH STREET AT 4TH AVENUE

This intersection has historically been subject to flooding due both to the large surface flows reaching it and the fact that the Tucson Arroyo culvert into which all of the existing catch basins on 4th Avenue drain is surcharged, in even relatively frequent storms. The surcharge causes culvert flow to bubble up into the intersection, but also prevents surface flow from entering the catch basins. Once the Park Avenue basin system is complete, surcharging will no longer be a factor. The new catch basins shown here will in conjunction with the existing catch basins accommodate the surface flow, effectively ending the flooding on 4th Avenue.

Also to be considered at this location is the effect of the new street car tracks through the intersection and how they may impact surface flow crossing 4th Avenue. It is important that the new catch basins, together with the existing ones, intercept as much of the 100-year storm at this location as possible to reduce the carry-over to the 8th Street/5th Avenue intersection where it is more difficult to deal with. The proximity of the Tucson Arroyo culvert to this intersection makes it relatively economical to do so. It is noted however that the tracks will not be higher than the existing crown and will not prevent carryover flow from crossing 4th Avenue.





New Grate Inlet by USACE within
Tucson High School campus

Elevations shown here
are plan elevations
raise 2.0' to adjust
to project datum



Cage of Truck Drive 23850

Tucson High School

Construct low
berm and/or
wall to elevation
elevation 23845

Regrade Field as
necessary to drain
to new inlet

Grate Elev: 23835

12 EF-1 grates in sump
S - 1418 cfs
y1 = 0.90' (in face)
y2 = 1.91' (outlet)
Use 0.90'

ATTACHMENT D



**PIMA COUNTY
REGIONAL FLOOD CONTROL DISTRICT
97 EAST CONGRESS STREET, THIRD FLOOR
TUCSON, ARIZONA 85701-1797**

**SUZANNE SHIELDS, P.E.
DIRECTOR**

**(520) 243-1800
FAX (520) 243-1821**

April 16, 2016

Albert Elias, Assistant City Manager
City Manager's Office
City Hall, 10th Floor
255 W. Alameda
Tucson, AZ 85701

Dear Mr. Elias:

Re: Arroyo Chico Final Construction Phase for High School Wash

On April 16, 2014, Mr. Huckelberry sent a letter (enclosed) to Richard Miranda concerning costs for the above referenced project. This letter is a follow-up to provide additional details on this vital project and our concerns that we may not be able to complete the work.

The U.S. Army Corps of Engineers (Corps) approved funding for the last phase of the Arroyo Chico Project to provide flood protection in the downtown area including Fourth Avenue. This was the only Arizona project that received funding for fiscal year 2014. This is an important part of the project which will address chronic flooding along Fourth Avenue and to allow the City of Tucson to proceed with the Downtown Links economic development plan.

The project was progressing with the full input and participation of the City of Tucson including a request from the City of Tucson Department of Transportation to provide additional storm drain laterals to collect approximately 600 cfs on 3rd Avenue and 8th Street (see enclosed letters). This flow was to be collected via storm grates that were originally to be built with the City's storm drain project on 8th Street, but was deleted due to high maintenance costs and traffic noise (see enclosed HDR Engineering's Offsite Drainage Analysis to the City). The report to the City further identified that without control of this stormwater, flooding would continue to impact Fourth Avenue at 7th and 8th streets including the residents and businesses along these streets.

If the additional flow is not collected, we will not be able to remove the downstream area between 3rd Avenue to the Santa Cruz River from the FEMA 100-year floodplain. Thus, if the High School Wash storm drain and the additional laterals are not constructed, the redevelopment area known as Downtown Links will not be suitable for development.

Several issues have driven the costs of the project up from the original construction bid provided by the Corps' contractor, Hunter Contracting, which includes:

1. The original bid for the 10-foot wide by 8-foot high storm drain was bid in 2010; the project cost was \$1,791,000. Construction costs for materials were much less in 2010 than they are now in 2014. For example, the unit cost for structural concrete was \$450 and in the present market the cost is \$600.

Albert Elias, Assistant City Manager

Arroyo Chico Final Construction Phase for High School Wash

April 16, 2014

Page 2

2. The depth of excavation has increased by 5.5 feet requiring more expensive shoring techniques which add to the cost.
 - a. The inside width of the box is now 12 feet causing interference with adjacent utilities, thus the culvert had to be shifted 5 feet to the north reducing working space and contributing to the need for shoring.
 - b. The storm drain we are connecting to was constructed by the City in 2012 and was built 1.15 feet lower than shown on the plans requiring us to further lower our planned storm drain. This discrepancy was discovered in March 2014 when Hunter was potholing to determine the location of underground facilities. This storm drain was also not horizontally located as noted in the City's as-built plans.
 - c. New Tucson Water standards have increased the depth of clearance from 3 feet to 3.5 feet.
 - d. The upgrade from a 10-foot wide by 8-foot high culvert to a 12-foot wide by 10-foot high culvert (an upsizing of 40% by area and 2 feet in height) required additional structural design which added an extra 1 foot to the foundation and an additional 10 inches to the roof.

With the added improvements, the Corps' contractor has negotiated a cost of \$4.28 million for the storm drain and laterals. The difference in cost between the 2010 contract amount and the current contract amount is \$2.49 million. While the Corps had informed us in December 2013 of storm drain betterment costs and utility costs, their estimate was \$1,176,427 for the storm drain (\$651,427) and utility relocation costs (\$525,000). We received approval from the Board of Supervisors for this amount. However, we now need an additional \$1,269,739 in funding to cover the increases for a total of 2,446,166.

When we agreed to fund and provide the improvements requested by the City of Tucson Department of Transportation the cost was purported to be \$140,000.

Given that the changes requested by the City were for improvements that were to be built with the Modern Street Car, we believe that the City should share in the cost increase, if the City wants this project to proceed.

Additionally, Tucson Water has set a hard date of Thursday, May 1, 2014, for the delivery of the 48-inch water pipe and Hunter has informed us that the pipe is scheduled to be delivered Tuesday, May 6, 2014. We cannot afford to further delay this water relocation to October 2014 and be encumbered by any additional charges by Tucson Water.

Sincerely,



Suzanne Shields, P.E.
Director and Chief Engineer

SS/tj

Enclosures

- c: C. H. Huckelberry, County Administrator
John Bernal, Deputy County Administrator for Public Works
Bill Zimmerman, Deputy Director – Regional Flood Control District

April 25, 2014



**CITY OF
TUCSON**
OFFICE OF THE
CITY MANAGER

Suzanne Shields, P.E.
Director
Pima County Regional Flood Control District
97 E. Congress Street, 3rd Floor
Tucson, AZ 85701

Subject: Arroyo Chico Final Construction Phase – High School Wash
TW Plan Number: 5-033-2013
Water System Modifications

Dear Ms. Shields:

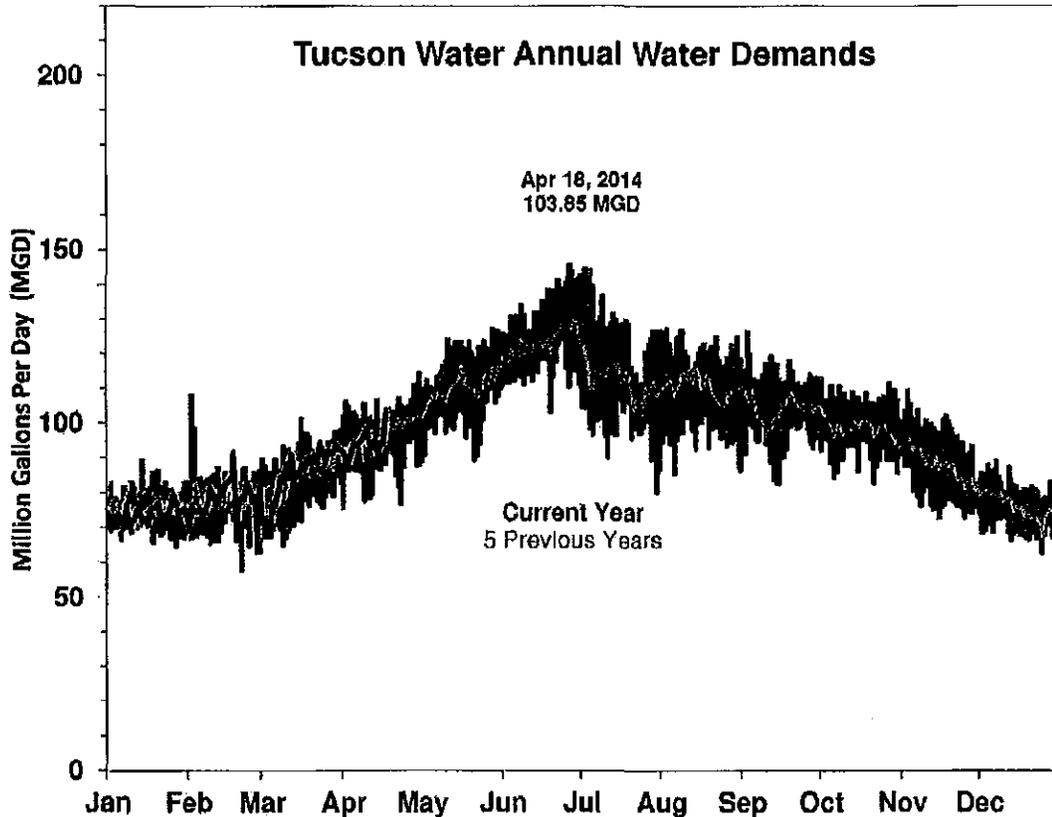
This letter is a response to your letter of April 16, 2014 regarding completion of the Arroyo Chico construction project. Given the long history of the City of Tucson working closely with Pima County and the US Army Corp of Engineers on flood improvements along the Arroyo Chico, the City remains committed to successful completion of the construction of the High School Wash project.

With regard to the shut down of the 48” potable transmission main and de-watering of the transmission main as part of the Arroyo Chico Final Construction Phase for High School Wash, Tucson Water proposes that work begin on the 48” transmission main after August 1, 2014. Tucson Water will pay the \$60,000 acoustic fiber contractor remobilization cost.

The condition of the 48” transmission main being out of service during the peak demand summer months of June and July would jeopardize water service within Tucson Water A1-Zone service area. This service area encompasses the northwest portion of the City of Tucson, the bajada of the Tucson Mountains plus booster pumps that lift water from the A1-Zone up and into the Catalina Foothills. August 1, 2014 is the earliest date the City can possibly take the transmission main out of service as will be explained in the following paragraphs..

Tucson Water also has no objection if RFCD prefers to start construction later, for instance in September 2014, to avoid the monsoon season. It is, however, requested that the City be informed ahead of time in order to coordinate the installation of the acoustic fiber optic cable upon completion of pipe construction, e.g., shut down, de-watering, and contractor, Pure Technologies, notification.

Tucson Water is able to shut down and de-water the 48” transmission main on or after August 1, 2014 and construction of the new section of said main can begin several days later. This date occurs after the summertime peak demand and hence the demand will continue to decrease. Please see the following “Daily Demand” graph shown below. This figure graphically illustrates the timeframe within which the work can be safely accomplished by avoiding the time of peak demand after July.



Additionally, to cooperate with Pima County and the US Army Corp of Engineers on this project, Tucson Water will pay for the remobilization cost for the installation of the acoustic monitoring facilities for the 48" transmission main. The cost is anticipated to rise from the already offered \$25,500 to \$60,000.

With regard to City of Tucson financial participation, we have constructed several improvements at no cost to the Pima County Regional Flood Control District that have directly benefited the High School Wash project and reduced flooding in the Fourth Avenue Business District.

When the U.S. Army Corps of Engineers (Corps) Project was originally scoped, plans included building a single cell 10'x8' reinforced concrete box culvert (RCBC) to connect to the existing Tucson Arroyo RCBC west of Fourth Avenue. The existing box culvert was structurally deficient due to a combination of substandard utility crossings (Pima County Wastewater sewer lines constructed inside of box culvert) and the age of the structure (Built in 1930). Additionally, the Corps did not account for breakout flows generated by surface drainage.

At a meeting held on July 14, 2010, with Pima County Regional Flood Control District (PCRFCFD), the Corps, TDOT, HDR, and Tetra Tech, the following design changes were discussed:

- Include catch basins and lateral pipe connections to collect surface flow on Eighth Street
- Increase size of Corps RCBC to 12'x8' to handle surface flow along Eighth Street and Third Avenue
- Add grates to top of culvert located in Tucson High athletic field to pick up overland flows and dry up existing High School Wash

In addition to these comments, the Corps recognized TDOT's proposed junction structure at the intersection of Fourth Avenue and Eighth Street will provide a cost savings to the Tucson Drainage Area project, Increment 4.

The Downtown Links is an improvement project that will provide enhancements, benefits, and connections for multi-modal users in and around the Downtown area. A critical element of this project includes major improvements to the storm drain system, including a dual cell 12'x10' RCBC replacing the existing Tucson Arroyo RCBC. Please see attached exhibit for an overview of Downtown Links and its associated drainage improvements.

In 2012, TDOT constructed the Eighth Street Drainage project as Phase 1 of Downtown Links, which included the following improvements:

- Dual 12x10 RCBC sized to collect all upstream 100-year flow
- Major sewer relocation and upsizing at no cost to Pima County
- 60" reinforced concrete pipe (RCP) and several catch basins along Seventh Street to reduce flows to the Third Avenue and Eighth Street intersection
- Junction structure at intersection of Fourth Avenue and Eighth Street (as discussed in the meeting held on July 14, 2010 with the Corps)

It should be noted the design of the dual 12'x10' RCBC was modified to accommodate a sewer crossing at Hoff Avenue by lowering the upstream elevation and eliminating the need for a custom box design by the Corps. Furthermore, the RCBC built for the Eighth Street Drainage Project was done so per plan both horizontally and vertically.

The breakdown of costs associated with Downtown Links (DL) Drainage improvements are as follows:

Description	Costs	Remarks
DL Phase 1, Eighth Street Drainage As-built Total	\$7,784,862.68	
a. 7th Street Storm Drain Improvements	\$248,843.66	<i>Improvements included to prevent flows from reaching 8th Street and 3rd Avenue Intersection</i>
b. 8th Street/4th Avenue Junction Structure	\$306,149.77	<i>Improvements included to prevent disruption of Modern Streetcar Tracks</i>
DL Phase 1, Drainage Subtotal	\$554,993.43	<i>a+b</i>
DL Phase 3 Drainage Improvements Estimate	\$7,595,710.00	<i>Represents approximately 10% of overall Project budget</i>

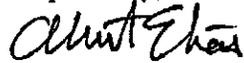
On July 18, 2013, TDOT submitted a letter to PCRFCFCD formally requesting the betterments intended to address flooding in the Fourth Avenue Business District be included in the Corps project, paid for by PCRFCFCD. The response received by TDOT is as follows:

- “We will be happy to include the request for improvements noted in your July 18, 2013 letter. We share the City’s goal to alleviate flooding in the Fourth Avenue business area. My staff will be working with HDR and the U.S. Army Corps of Engineers to see that these improvements are added to the project with the District providing the necessary funding.”

The City of Tucson has expended considerable funds for the Eighth Street Drainage Project and the Seventh Street Storm Drain that have resulted in reducing flooding in the immediate vicinity of the High School Wash. As a result of these improvements there is direct cost savings to this project. It is requested that these investments be acknowledged as contributions by the City of Tucson. These have been made in the spirit of cooperation that has historically taken place between the City of Tucson and Pima County along the Arroyo Chico.

If you have any questions or desire further discussion, please contact me at 791-4201.

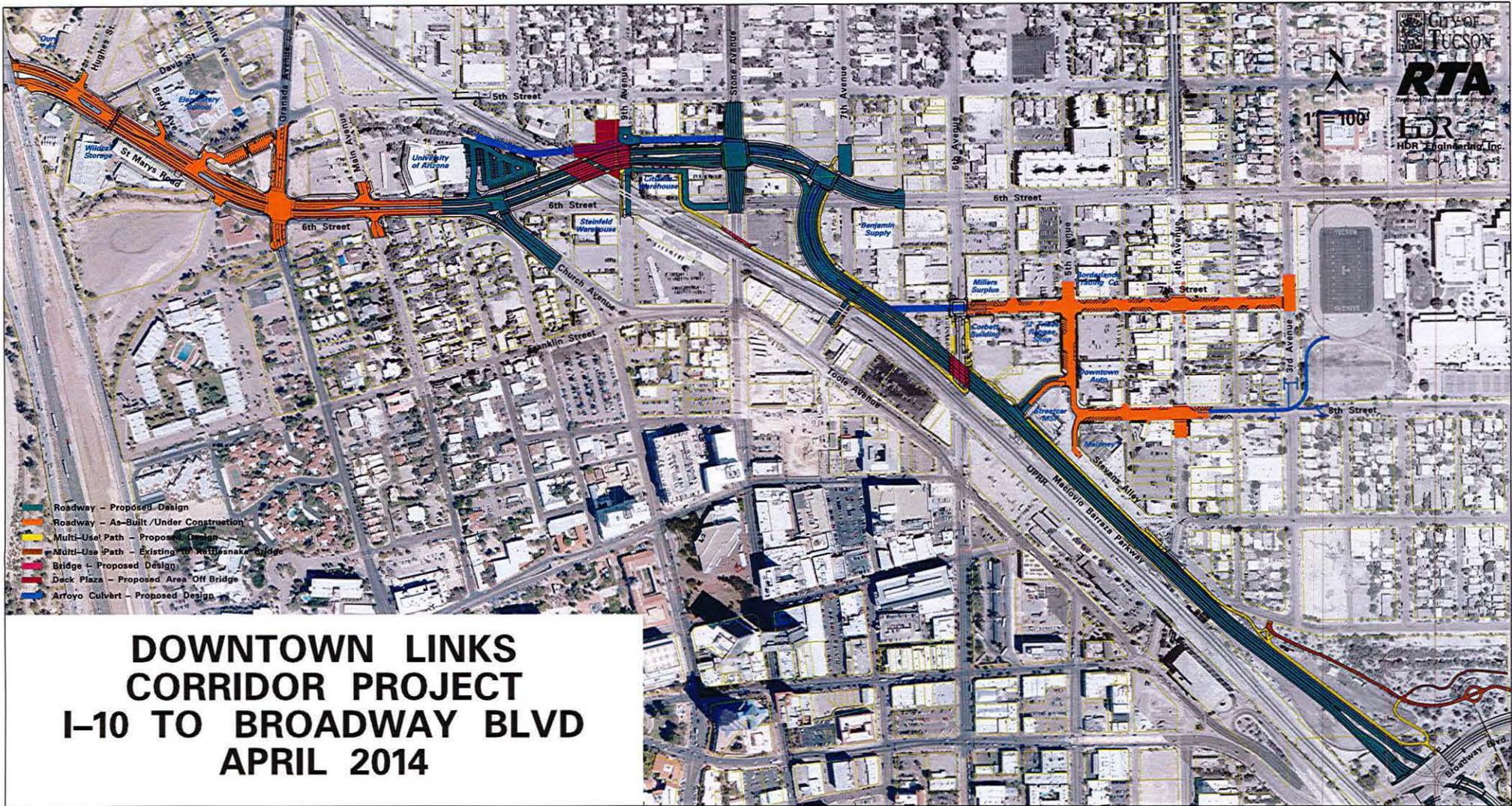
Respectfully,



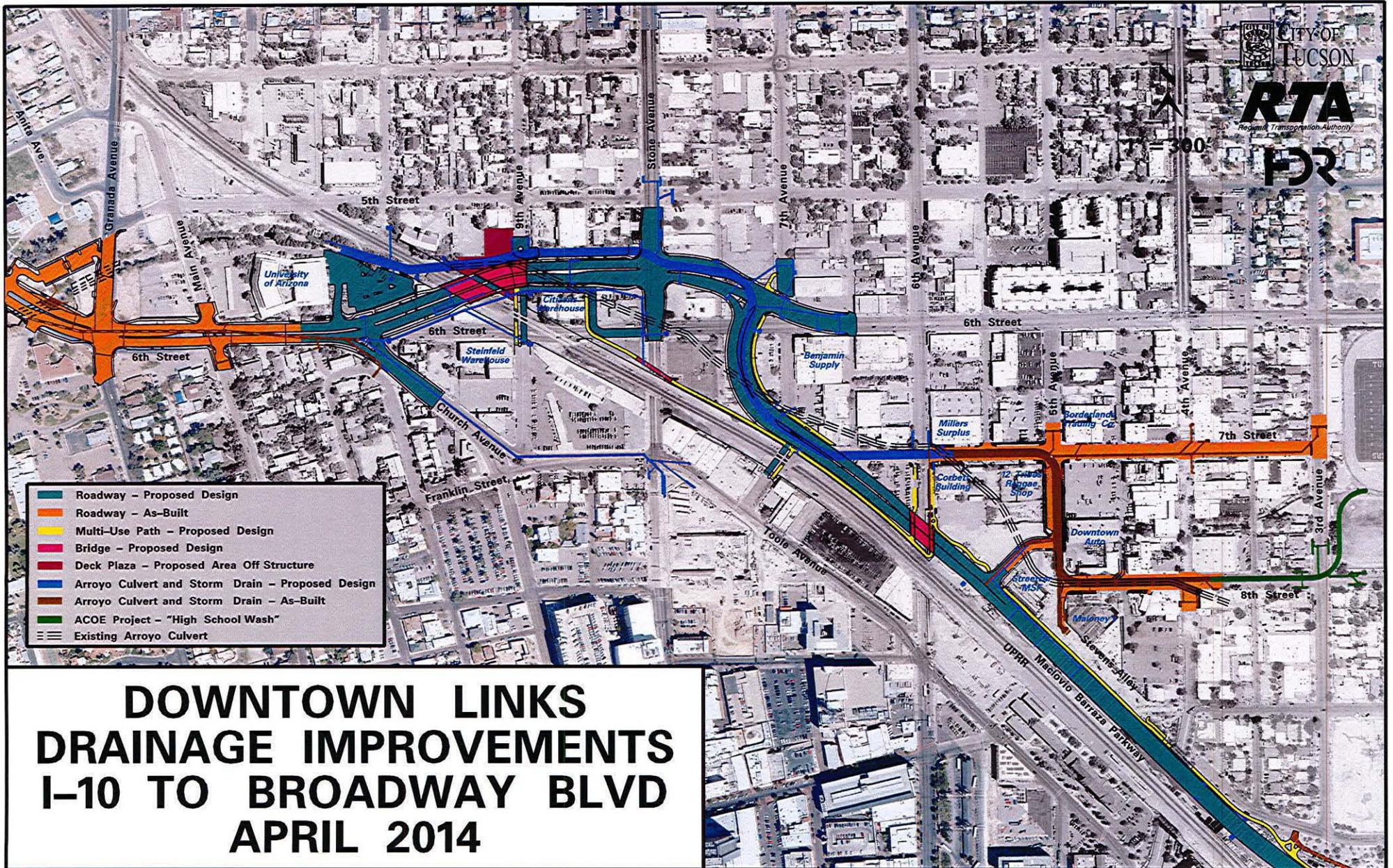
Albert Elias
Assistant City Manager

cc:

Richard Miranda, City Manager
Daryl Cole, Tucson Department of Transportation, Director
Fred Felix, PE, TDOT Engineering Division Administrator
Alan Forrest, PE, Tucson Water, Director
Sandy Elder, PE, Tucson Water, Deputy Director
Edward Lopez, PE, Tucson Water, Distribution Design Section Supervisor
C.H. Huckelberry, Pima County, County Administrator
John Bernal, Deputy County Administrator for Public Works
Bill Zimmerman, Deputy Director, Regional Flood Control District



**DOWNTOWN LINKS
CORRIDOR PROJECT
I-10 TO BROADWAY BLVD
APRIL 2014**



**DOWNTOWN LINKS
DRAINAGE IMPROVEMENTS
I-10 TO BROADWAY BLVD
APRIL 2014**



CITY OF
TUCSON

TUCSON WATER
DEPARTMENT

March 24, 2014

Mr. Larry Robison, P.E.
Pima County Regional Flood Control District
97 E. Congress, 2nd Floor
Tucson, AZ 85701

Subject: **High School Wash Storm Drain
TW Plan Number: 5-033-2013
Water System Modifications
Revised Schedule and Associated Tucson Water Requirements**

Dear Mr. Robison:

Last week Steve Melton of Hunter Contracting informed Tucson Water that the pipe manufacturer, Ameron, will not be able to deliver the 48" welded steel pipe to the project site until May 1, 2014. As you will recall Tucson Water previously stated that the absolute deadline for having the 48" transmission line back in service was May 14, 2014, due to the increased demands that accompany the higher temperatures of Spring and Summer.

In an effort to work cooperatively with all parties involved in this endeavor, and understanding Tucson Water's demand position, Tucson Water has conducted major analysis on our overall delivery system and with thoughtful and careful consideration has formulated a plan to cautiously extend the back in service deadline to June 1, 2014. This analysis and the resulting reallocation of water resources available within our system was not easily achieved, and strikes a delicate balance between the requirements of this project and the requirements of the overall Tucson Water service delivery system.

Therefore, with this impending extension of the deadline to June 1, 2014 certain conditions are required:

1. The new 48" steel pipe must be on site by or before May 1, 2014.
2. The contractor must be ready to commence installation when pipe arrives on site.
3. Complete installation must take no more than 3 weeks and be finished on or before May 22, 2014.

Keep in mind that the acoustical fiber optics monitoring system will have to be installed upon completion of the pipe installation and prior to the back in service date of June 1, 2014.

Page 1 of 2



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(520) 791-2648 • FAX (520) 791-4199 • TTY (520) 791-2639 • www.cityoftucson.org



Subject: **High School Wash Storm Drain**
TW Plan Number: 5-033-2013
Water System Modifications

Due to the critical nature and impact this deadline extension will have on the Tucson Water delivery system, all parties involved must understand that these conditions are non-negotiable.

Furthermore, to facilitate delivery alternatives and the 48" transmission main shut down and start up, Tucson Water intends to re-activate this 48" transmission main as soon as possible and shut it down again a week prior to the start of construction, contingent upon whether the May 1, 2014 deadline for the delivery of pipe and immediate start of construction will be met. If the May 1, 2014 deadline cannot be met, Tucson Water will not shut down and dewater said transmission main and the project will have to be postponed with no financial liability to Tucson Water.

We respectfully request that you coordinate with the contractor and pipe manufacturer so as to provide assurance that this final revised schedule can be met.

If you have any questions or comments, or desire further discussion on this matter please give me a call.

Sincerely,



Richard A. Sarti, P.E.
City of Tucson, Water Department
Modifications Unit
Project Manager

RS:rs\Modifications\Arroyo Chico Tucson Basin 00492\Assignments\6319 revised schedule ltr.doc

cc: Suzanne Shields, PE, Pima County Regional Flood Control District, Director
Bill Zimmerman, Pima County Regional Flood Control District, Deputy Director
Alan Forrest, PE, City of Tucson, Water Department, Director
Sandy Elder, PE, City of Tucson, Water Department, Deputy Director
Pat Eisenberg, PE, City of Tucson, Water Department, Water Administrator for Engineering
Edward Lopez, PE, City of Tucson, Water Department, Distribution Design Section Supervisor
Jeff Drumm, PE, City of Tucson, Water Department, Construction Section Manager
File

Page 2 of 2





April 11, 2014

UNITED STATE ARMY CORP OF ENGINEERS
Tucson Project Office
Bldg. 1605
Davis-Monthan AFB
Attn: Shari Brandt SPL
5205 East Comanche St.
Tucson, AZ 85707

RE: Contract No. W912PL-10-C-0032
Tucson Drainage Area Phase 2B

Subject: RFP-0044 "High School Wash Improvements"
RE: Modifications to Increment 4 Narrative of partial NTP

Dear Ms. Brandt,

Hunter Contracting Co. (HCC) has looked at changes related to starting more work on increment 4 if we must delay starting the box culvert work until approval to start the box culvert work late May. This would include all waterline installations other than the lines that would run across the new box culvert, the sewer line installation other than the section crossing the box culvert from manhole #1 to manhole #2 and installing many of the storm drain catch basins and starting some of the RCP installations where needed to facilitate other utility work.

Water line work;

1. Both the 6" ductile iron pipe (DIP) and the 12" DIP and related cross and valves could be installed at 3rd AVE and 8th St. The work would also facilitate the installation of the services from the new waterlines to the houses where needed. The 6" waterline needs to be installed prior to the 48" waterline so the 6" pipe is out of the way of the 48" waterline installation. The 12" waterline needs to be installed partially for the same reason to remove it from being in the way of the 48" installation however there is a section of the 12" that may need to be relocated or capped temporarily during installation of the 48" waterline. The 12" waterline will need to be installed prior to the installation of the storm drain pipe on the south side of 8th St. between 3rd and Bean. The 48" waterline can be installed after all the other waterline work unless we cannot start that work prior to May 1st when Tucson Water has given us a deadline to begin that installation of the 48" waterline. If the 48" cannot be installed in May it will need to be installed in October. The other waterline work can be installed either way whether the 48" is installed in May or October.

Sewer Line Work

2. The 10" sewer mains (PVC) could be installed on 8th St. up to manhole #2 from manhole #3 as long as the storm drain RCP run that crosses that sewer line on the south side of the street can be put in under the proposed sewer line first or the sewer line can convert to DIP at that location to satisfy Pima County Wastewater requirements. The sewer line across the box culvert cannot be installed until the box is installed in the area of Hoff Road, this run is from manhole #2 to manhole #1. Manhole #1 will need to be installed after the box culvert is installed in the area of Hoff due to its close proximity to the excavation for the box culvert.

3. The storm drain system has many components that could be installed. Catch basins may be able to be installed before the box culvert or to assist in the other utilities if needed. HCC prefers to install the RCP from the lowest connection point and lay the pipe uphill but can install the pipe the other way if needed.

The bottom line here is we do have many things we can do at this time and would welcome the start of any utility work NTP. HCC does not see a definite savings to the sewer system by starting utility work at this time and does not see a need to start the bypass work yet. I looked at the bypass work at manhole 2 to manhole 1 and determined that the bypass is not needed because we will be bypassing upstream of that location anyway and will not need to bypass in two locations. We also do not need to bypass to install the sewer lines up to manhole 2 from manhole 3. To install manhole #1 and the pipe and over the box culvert later will not need a bypass if we are controlling the flow upstream.

CLIN Items and percentages of each that can be done immediately:

1. CLIN 121 Total \$49,612 we will need to perform the three items related to the water services for a total of 61% of the item or \$30,263
2. CLIN 122 Total \$8,435 Clearing, grubbing and stormwater controls, we will need 25% of this item which would be some clearing and the stormwater controls for a total of \$4,609
3. CLIN 123 Demolition Total \$122,900 we will need to remove a portion of sidewalk, curb, AC, Sewer, and waterline. This does not include 48" pipe removal or jogging track curb or box culvert removals. The total we need to perform this work is \$22,500 or 18% of the item.
4. CLIN 124 NA
5. CLIN 125 Total \$665,986 we do not anticipate the pipe getting to us prior to May 6th or we do not anticipate having to pay for anything prior to mid-May so I would say \$0 for CLIN 125 at this time.
6. CLIN 126 Total \$132,278 we will install all of the 12" & 6" waterlines so this entire CLIN will be used for a total of 100% or \$132,278.

7. CLIN 127 Total \$57,158 we will install most of this pipe and manhole work for a total of 82% or \$46,870.
8. CLIN 128 Total \$60,282 we will need to set up are traffic control and maintain it for 1 to 1.5 months prior to the anticipated NTP for a total of 60% or \$36,169.
9. CLIN 129 Total 37,026 we can install the catch basin and none of the RCP for a total of 92% or \$34,026.
10. CLIN 130 Total \$65,365 we can install the catch basin and part of the 30" RCP for a total of 63% or \$41,180.
11. CLIN 131 Total \$97,942 we can install both the catch basins and some of the RCP for a total of 52% or \$51,000.
12. CLIN 132 Total 180,178 we can install the catch basin, Storm Drain MH, none of the parkway grading and some of the RCP for a total of 52% or \$93,000.
13. CLIN 133 Total \$349,701 we do not need to install the sewer bypass until either the box culvert starts or the 48" WSP so for now \$0 for CLIN 133.
14. CLIN 134 NA
15. CLIN 135 NA until the box culvert starts.
16. CLIN 136 NA until the box starts.
17. CLIN 137 NA until finish work begins.
18. CLIN 138 No landscape until box starts however we would like to remove the trees so we can use the area to store materials essential to the waterline work for a total of \$4,400 or 7%.
19. CLIN 139 NA
20. CLIN 140 NA

Total for the items and percentages proposed in this letter is \$496,295.

Do not hesitate to call with questions or if you would like additional information.

Steve Melton

Hunter Contracting Co.

ATTACHMENT E

Work Related to the Modern Streetcar Project:

- **3SMR01 – Modern Street Car Ph1** - Total Project was \$519,373. . This project included cured-in-place piping to rehabilitate approximately 3,000' of sewer lines impacted by the Streetcar along University Blvd. It also included utilities and HCS work.
- **3STC12 – Modern Streetcar Ph2** - Total Project Budget is \$601,057. This project included cured-in-place piping to rehabilitate several sewer segments impacted by the Streetcar along Broadway Avenue. It also included utilities and HCS work.

Work Related to Downtown Links:

- **3DTL1A – Downtown Links Ph1A** - Total Project Budget is \$531,245. The Downtown Links St. Mary's Road I-10 to Church Avenue roadway project includes several sewer lines that will need to be relocated to accommodate new road grades, drainage installation, and water line relocation. In addition to sewer relocation, a portion of sewer main in St. Mary's Road and in 5th Street near Davis Street, which is no longer in service, will be removed and two house service connections (HCS's) will be rerouted through new sewer to improve system operation.
- **Downtown Links Ph3** – New Project under Utility Coordination with COT. Using as a basis the previous 2 phases, the RWRD portion of the work will be around \$1M.

Work Related to Downtown Rio Nuevo Area:

- **3RNW14 - Rio Nuevo CIPP 60" Rehabilitation Project** \$727,374.00
- **3RNW15 - SEI Rehabilitation at Congress St. - Phase II** \$980,000.00
- **Diversion Manhole 9910-DIV08 Rehabilitation/Modification at Alameda and Congress Street** \$145,443

Pre-Construction CCTV of affected areas to verify the impact of the scope work proposed:

- **Courts Complex Project:** \$2,601.89
- **Downtown Links Project:** \$10,374.82
- **Modern Streetcar Project:** \$27,885.56

We have completed multiple repairs and projects around the Downtown Area. For example, JO 313087 501 N. Stone Ave. (Ash Ave.) – is currently underway for a total amount projected at \$ 172,106.02.

ATTACHMENT F

RESOLUTION NO. 2014-FC _____

A RESOLUTION OF THE PIMA COUNTY FLOOD CONTROL DISTRICT BOARD OF DIRECTORS APPROVING ADDITIONAL FUNDING FOR THE FINAL PHASE OF THE ARROYO CHICO DRAINAGE IMPROVEMENT PROJECT (*District 5*)

WHEREAS, the Arroyo Chico Drainage Improvement Project (“the Project”) is a multi-year federally funded project that the Pima County Regional Flood Control District (“District”), as the Local Sponsor, initiated with the U.S. Army Corps of Engineers (“ACOE”) in 1999 under Federal Contract Number 01-04-125833-0499 (“CT 14*198”), and

WHEREAS, the Project was authorized by Section 101 (a)(5) of the Water Resources Development Act of 1999 (WRDA 1999) and Public Law 106-53 to provide flood protection improvements within the central area of the City of Tucson which included the Arroyo Chico Wash and its tributaries, and

WHEREAS, the final phase of the Project (“Phase 3”) is the construction of the High School Wash Storm Drain and Channel Improvements upstream of Campbell Avenue, and

WHEREAS, the ACOE has proposed to construct additional storm drain betterments to the Phase 3- High School Wash Drainage Improvements, and

WHEREAS, the District’s local share of the Phase 3-High School Wash Betterments proposed by ACOE is \$1,500,000.00 including \$230,0262.00 of contingency funds,

NOW, THEREFORE, upon motion duly made, seconded and carried, be it resolved that:

1. The Board hereby approves the addition of \$1,500,000.00 to Phase 3 of the Tucson Drainage Area Project, which represents \$1, 269,738.00 for betterment costs plus \$230,262.00 in contingency funds.
2. The Board further authorizes the Procurement Director to add the \$1,500,000.00 of District funds to Contract Number CT14*198.
3. The appropriate District officers and employees are hereby authorized and directed to perform all acts necessary and desirable to give the effects to this Resolution.

PASSED, ADOPTED AND APPROVED this _____ day of _____,
2014.

**PIMA COUNTY REGIONAL FLOOD CONTROL DISTRICT
BOARD OF DIRECTORS**

Sharon Bronson, Chair

ATTEST:

Clerk of the Board

Approved as to form:



Deputy County Attorney