

CITY OF LONGMONT VANCE BRAND MUNICIPAL AIRPORT



Southwest GA Development Area Preliminary Planning Study

Final Summary Report

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Prepared for:

City of Longmont
Vance Brand Municipal Airport
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1.0 Executive Summary

Vance Brand Municipal Airport (LMO) is located in Longmont, Colorado in the northwest corner of the Denver metropolitan area, approximately 2.75 nautical miles from Longmont's Central Business District. The airport typically services small and corporate general aviation (GA) air traffic with a single runway, parallel taxiway system, several aircraft parking aprons, one fixed-base operator (FBO), numerous hangars on the north side of the airfield, and a small hangar development on the southern side of the airport.

1.1 Background and Statement of Purpose

The City of Longmont (City) is preparing to further develop the southwest side of the Airport for additional general aviation support facilities, including corporate aviation, aviation support companies, expanded private aviation, and potential non-aeronautical activities.

The goal for the planning study is to provide the City and LMO with preliminary guidance for future expansion in the Southwest GA development area, with a focus on utility and drainage infrastructure planning. The hangar development on the north side of the airfield was not properly planned, with individual parcel improvements taking place without consideration of the overall northern GA development, utility, and storm drainage impacts. This has created issues for the City with respect to operations optimization, utility maintenance, potable water and sanitary service capacity to serve tenants, and storm water quality and conveyance.

In order for the City to adequately facilitate the Southwest GA corridor development, the City has contracted with CH2M (Consultant) to complete a preliminary planning study to outline requirements for infrastructure improvements to support the future development.

This *Final Summary Report* provides a summary of existing conditions in the Southwest GA development area; the proposed development plan options, including utility and storm drainage improvements; conceptual construction cost estimating; and the Consultant's recommended development alternative.

1.2 Summary of Findings

The proposed southwest development area is largely undisturbed with minimal existing infrastructure. A small GA hangar array is located on the east side of the development area. Mile-Hi Skydiving operates in the area out of a small Quonset hut on a leased parcel (12,780 SF). A weather (and other sensor type) testing facility is located in the southwest corner of the proposed development area.

A 12-inch PVC water main runs parallel to Rogers Road on the south side of the road, outside of the proposed development area. An 8-inch PVC water loop system feeds off the 12-inch main to serve the existing GA hangars. This water line is for fire protection only. A 4-inch gas line parallels the 12-inch water line and also serves the GA hangar array. Existing storm infrastructure, electric, and communications lines were not identified in the development area.

The proposed development area topography is relatively flat. The area slopes from west to east with natural low points at the locations of two existing detention basins. Runoff from the site is conveyed to one of the two existing detention basins, before discharging to Lykin's Gulch. There is a sump (low area) located in the middle of the proposed site. An eroded berm has also been identified in the development area.

The site is bordered on the north by a drainage swale which runs parallel to Taxiway B on the south side of the taxiway, Peck Ditch on the west side at the Airport property limits, and Lykin's Gulch - Rodgers Road on the south side at the Airport property limits.

The proposed development site is home to an active prairie dog colony and raptor nests, and it is covered with a thistle infestation. Consideration and advanced planning for relocation and eradication of these elements will need to be considered.

1.3 Consultant's Recommendations

The Consultant recommends Option 1 as the preferred development plan. See Appendix D for the Option 1 Layout Plan exhibit.

Option 1 provides for optimized use of available land area for airside-landside developments, and incorporates all elements desired of the Southwest GA Development Area, including Airport and City feedback, tenant feedback, and LMO MPU projected facility needs.

In consideration of all factors for each of the two development plan options, including airside-landside operations, storm and utility infrastructure improvement requirements, and associated construction costs, Option 1 is identified as the more optimal solution to meet the Airport's Southwest GA Development needs.

1.4 Study Limitations

This Southwest GA Development Area – *Preliminary Planning Study* has been completed, in order to (1) provide a conceptual utility corridor layout and (2) identify storm drainage infrastructure improvements that will accommodate the preferred development plan for airside-landside infrastructure in the proposed development Area. While the two proposed development options (see Appendix D) identify a build-out that meets the projected needs of the Airport, the final development of infrastructure may not necessarily be constructed as depicted.

The conclusions summarized herein for utility and storm drainage preliminary planning are to be used for planning purposes only, and shall not be used for bidding and construction purposes. All assumptions and conclusions generated as a result of these efforts shall be verified by on-site studies (utility locates, topographic survey, geotechnical analysis, etc.) and detailed engineering design to verify specific needs of future tenants, prior to commencement with contractor procurement and construction activities.

Utility capacity analysis and connection layouts for individual tenants is beyond the scope of this planning study. As unique tenant site development plans are identified, through phased parcel developments, utility needs for these specific prospective tenants will be required as part of their site-civil design Engineering services.

Both of the concept development plans require full-spectrum detention basin improvements and widening of the northern drainage swale. These permanent stormwater facility improvements will need to be completed to address water quality, conveyance, and detention requirements, regardless of the specific development plan implemented. Specific storm capture and conveyance requirements for new inlets and RCP pipe will vary, depending on the infrastructure development plan implemented.

The ultimate layout plan for airside-landside facilities identified in the preferred development plan, will be demand-driven by tenants of unknown origin, operational characteristics, and size. The utility corridor location and storm infrastructure improvements accommodate the development plans included in Appendix D. Following installation of the utility corridor and completion of site storm improvements, the Airport has stated they can be flexible with specific site developments to meet future tenant needs, so long as they don't require modifications to the utility and storm infrastructure constructed to serve the entire Southwest GA Development Area.

2.0 Summary of Existing Conditions

An investigation of existing conditions was conducted and the information was analyzed to form the basis for the proposed development plan. Former planning studies, topographic survey data, storm drainage infrastructure, and existing utility data was obtained from Airport staff, the City, utility owners, and as-built records. The following outlines the summary of findings and existing conditions in the Southwest GA Development Area.

2.1 LMO MPU and ALP

The LMO Master Plan Update (14 March 2012) was completed to determine the extent, type, and schedule of development needed to accommodate future aviation demand at the Airport. The study's main objectives were as follows:

- Determine the condition and adequacy of existing facilities.
- Forecast aviation activity for a 20-year timeframe, including operations and based aircraft.
- Recommend needed improvements over the next 20 years that meet the forecasted and safety requirements at LMO, while addressing the values and economic growth plan of the community.
- Prepare a financial plan that considers LMO's budget, revenue, and expenses along with likely grant funding scenarios.

The study includes an Aircraft Operations Forecast Summary, which projects an overall 20-year annual compounded growth rate of 2.06% at the Airport. Total operations are projected to increase from 61,211 in 2010 to 92,067 by 2030.

Once reaching a level of 500 annual operations of an aircraft that falls into the next highest Aircraft Reference Code (ARC) level, the FAA considers the Airport should upgrade its facilities to meet the design standards for that aircraft type. Presently, LMO has an ARC of B-II. Aircraft in this category include general aviation aircraft and smaller corporate jets. The Master Plan Study concludes that the current ARC of B-II for LMO is appropriate for the current and forecasted aircraft types, with no significant increase in aircraft size expected.

The primary objective of the Airport Master Plan is to determine the adequacy of the existing facilities and to identify recommended and required improvements, based on current and future aircraft operating at LMO. The number and types of projected General Aviation (GA) operations and based aircraft can be converted into a generalized projection of GA facility needs. GA facilities include FBOs, hangars, aprons, and aircraft tiedown space.

The LMO Master Plan identified the following GA facility improvement needs:

Aircraft Storage - Hangars

Hangar requirements are a function of the number of based aircraft and forecasted based aircraft. Most hangars at LMO are privately owned on land leased from the City of Longmont. The study found that an average of 1,632 SF of hangar space is required for each based aircraft. The master plan projects a 248,064 SF shortfall in hangar space by 2030. Airport user surveys conducted during the master plan study overwhelmingly indicated the need for additional hangar space on the airport.

Aircraft Parking Aprons

Aircraft parking aprons provide parking for based and transient airplanes, access to the Terminal facilities, fueling, and surface transportation. The master plan study indicates that FAA AC 150/5300-13 outlines an area of 360 square yards of apron space is required for each transient aircraft, resulting in roughly 7,920 SY of desired apron space required for transient aircraft in 2030. LMO currently has 5,434 SY of apron space, indicating a forecasted shortfall of 2,486 SY by 2030. The master plan study recommends that additional apron space be added for both based and transient aircraft, as the current space begins to reach capacity.

FBO Facility

The master plan study indicates that land-use planning at LMO should include a new executive flight center building, in order to better serve airport users and corporate businesses. This facility would house an FBO, year-round restaurant, pilot lounge, meeting/conference room, and offices for airport management.

Support Facilities

Currently, there are limited support facilities for maintenance on the airport. The master plan study recommends that LMO construct an SRE/Maintenance building to house the snow plow and sweeper, as well as an office for airport management. Additionally, it is recommended that LMO add an Aircraft/Equipment Wash Pad on the airport property to ensure long-term maintenance of the airport, as well as an additional Airport revenue stream for tenants that use the pad to wash their aircraft.

Fuel Storage

All of the fuel storage at LMO is owned and operated by private companies. Additional fuel storage will be added by the private sector in the future, when necessary to meet the demand levels. Currently, the only Jet A fuel storage at LMO is the 2,200 gallon tank owned by Fly Elite Aviation. The master plan study recommends the installation of a new 10,000 gallon tank for Jet A fuel to better accommodate the fuel needs of the corporate aircraft that operate at LMO, and to meet increased future demand for Jet A fuel.

Utility Infrastructure

Utilities provide the Airport with potable water, sanitary sewer, fiber optics, phone, electric, storm capture and conveyance, and natural gas. There are no utilities present in the proposed Southwest GA Development Area, with the exception of an 8-inch PVC water line. The nearest water and sewer lines on the southwest side of the airfield are located adjacent to Airport Road, approximately 1,500 feet away from the property line. See Appendix B for the Southwest GA Development Area *Existing Utility Map*.

The master plan study recommends that the water and sewer utilities be extended from Airport Road to the southwest side of the airport to accommodate the utility demands of future development in the Southwest GA Development Area. Additional utility demand needs be addressed to assess capacity and need for storm, communications, and power to serve future facilities once the specific facility types and operational needs are determined.

The Master Plan Study recommends that the City of Longmont include in the LMO Master Plan the preferred concepts for both commercial and private hangars on the north side of the airport and reserve space for hangar development on the southwest side of the airport. On December 6, 2001, Longmont City Council voted to reserve space on the south side of the airport for hangar development. The specific facilities, hangars, sizes, configurations, and locations will be determined at the time of development, as required by the City.

The southwest portion of the airfield has been identified by the Airport as a future GA development area, as indicated on the Airport Layout Plan (18 Feb 2012) and the Terminal Area Plan South (18 Feb 2012). See Appendix A for the referenced ALP drawings.

2.2 Site Topography – Storm Runoff

Existing site topography was identified and analyzed using a combination of existing survey, as-built drawings, topography from the U.S. Geological Survey (USGS) National Elevation Dataset (NED), and Google Earth imagery. A new topographic survey was not conducted in conjunction with these preliminary planning services.

CH2M utilized the U.S. Geological Survey (USGS) National Elevation Dataset (NED), in order to develop Southwest GA Development Area contour mapping. Specifically, the following dataset was utilized:

- U.S. Geological Survey, 20150717, USGS NED 1/3 arc-second n41w106 1 x 1 degree ArcGrid 2015.
- Topography projection to NAD 1983 HARN State Plane Coordinates, Colorado North FIPS 0501 Feet.

Currently, the Southwest GA Development Area slopes from west to east with natural low points at the locations of two existing detention basins. See Appendix B which includes the *Existing Drainage Basins and Surface Flow Patterns* exhibit. Runoff from the site is conveyed to one of the two existing detention basins, before discharging to Lykins Gulch. Flow in Lykins Gulch is ultimately conveyed to the east to St. Vrain Creek. There is a sump (low area) located in the middle of the proposed site that may contribute to some of the drainage problems currently identified by the City. An eroded berm has also been identified, which may contribute to an unforeseen amount of on-site flow being conveyed to the eastern detention basin.

There are no regulatory floodplains within the proposed development area. The Lykins Gulch floodplain is recognized by the City of Longmont. This floodplain will not be affected by the Southwest GA Development. Adverse impacts to Lykins Gulch will be mitigated by way of construction of the full-spectrum detention basin proposed in the Southwest GA development plan options. See Appendix D for development plan Option 1 and Option 2.

The Floodplains Map is included in the Appendix B for reference.

2.3 Existing Utility Infrastructure

The proposed development site is not currently serviced by utility infrastructure. Utility infrastructure information for the surrounding areas, including the GA development just east of the proposed site, was obtained through the Airport, City of Longmont, and the various utility companies.

See Appendix B for the Southwest GA Development Area *Existing Utility Map*.

The wet utilities are owned by the City of Longmont. An existing 12-inch PVC water main runs parallel to Rodgers Road, approximately 185 feet south of the edge of pavement. An 8-inch loop system serves the existing south T-hangar development. This water line is for fire protection only. The existing sanitary sewer system is much further away. A 12-inch PVC gravity sewer runs along the west side of Airport Road, and a 21-inch PVC gravity sewer runs approximately 1,080 feet south of Rodgers Road. These two sanitary lines join at the intersection of Rodgers Road and Airport Road and flow to the east via a 27-inch gravity sewer line.

Xcel Energy is the provider for natural gas service in the region. A 4-inch Polyurethane main distribution line runs along Airport Road with a 4-inch branch line on Rogers Road. A compressor station is located off of Rogers Road and helps regulate system pressure in the system for this area. The 4-inch gas line on Rogers Road continues to serve the South GA development via 2-inch or smaller service lines.

Longmont Power and Communications is the provider for electric and communications services in the region. Per email correspondence with Longmont Power and Communications on 28 Dec 2016, it was stated that there is not enough capacity along Rogers Road to support the proposed development with existing electric infrastructure. The potential development of the nearby Huff Property may then provide ample capacity along Rogers Road and significantly reduce service extension costs. Due to the uncertainty and timing of the Huff Property build-out, it is assumed service will be extended from the Nelson Road and Airport Road intersection to the south, where sufficient electric capacity currently exists. Telecom service is provided by NextLight, available near the Nelson Road and Airport Road intersection.

3.0 Proposed Development Plan

Information acquired in the existing conditions investigation was analyzed for preparation of a proposed GA Parcel Map and two unique Concept Development Plans for the LMO Southwest GA development Area.

The Parcel Map depicts existing facilities and generic boundaries for the different types of proposed facilities, including corporate aviation, small general aviation, skydiving, and non-aeronautical development. The Parcel Map was developed through feedback received from the Airport and the City, and it serves as a guide for future land-use planning of the development area. See Appendix C for the Parcel Map.

The concept development plans further refine the layout of proposed facilities in the Southwest GA Development Area, based on projected infrastructure needs within the land-use areas defined on the Parcel Map. See Appendix D for development Options 1 and 2.

The concept development plans were developed in accordance with the following governing criteria: FAA Advisory Circular (AC) 150/5300-13A; Code of Federal Regulations Title 14, Part 77: *Safe, Efficient Use, and Preservation of the Navigable Airspace (Part 77)*.

3.1 Southwest GA Parcel Map

The parcel map is a high-level planning concept that depicts generic boundaries for the various facilities projected to be located in the Southwest GA Development area. The parcel map outlines an optimized approach for development which considers existing infrastructure, current tenant needs, and future growth plans. The parcel map considers prioritized access for future growth considerations which meet the needs of airport tenants, airport maintenance and operations, transient and based aircraft, and landside facilities for public use. The parcel map outlines development to occur around existing facilities, including the Mile-Hi Skydiving operation and weather service installation.

Corporate aviation facilities are outlined along the Taxiway B frontage, with access via central Taxiway B2. This area includes a potential FBO installation, aircraft parking ramp, support facilities, aircraft wash station, and aircraft fueling. This area is generally a public-use area, designed to support the aviation community via aircraft and pilot services which will encourage GA traffic growth at LMO, including smaller corporate jet traffic.

The future Mile-Hi Skydiving facility expansion is outlined on the northwest portion of the development area, to include areas for owner occupancy, drop zones, and a swoop pond. This northwest corner is an ideal location to conduct sky-diving activities, while reducing impacts to southern GA aircraft operations.

Small GA aircraft hangar storage is outlined on the south-central side of the development area. This area will include owner-occupied and leased t-hangars and box hangars for LMO based aircraft. Non-aeronautical development is included along the southern boundary of the development area, due to landside accessibility from public roadways outside of the Airport AOA. Non-aeronautical uses on the south-central side of the development will only be allowed until the area is needed for aeronautical purposes.

3.2 Southwest GA Development Plans

Two unique concept development plans were completed to incorporate infrastructure layout options within each of the parcel areas depicted in the Southwest GA Parcel Map. The development plans serve to provide guidance to the City and the Airport for progressive land development, based on near-term and long-term needs of the Airport and the local GA community.

The two plans were completed with consideration of the following general guidance:

- LMO ALP; MPU recommendations outlined herein (Section 2.1).
- Existing utility infrastructure accessibility.
- Airport feedback for desired land-use and expansion plans, including landside/airside access, general facility requirements, and operational considerations.
- Horizontal spatial planning, to include: FAA operational clearances (Taxiway/lane Safety Area, Taxiway/lane Object Free Area, Wingtip Clearances), Part 77 impacts, aircraft turning movement analyses, Building Restriction Lines, Building Code requirements, and landside roadway access and parking lot layouts.
- Aircraft fleet mix anticipated to use the various facilities.
- Lease parcel planning for light aircraft hangars, large corporate GA hangars, and specific FBO operations.

Specific development needs and feedback which was incorporated in the development plans includes the following:

- Taxiway B frontage is a priority for new businesses and private development, with a preference for corporate aviation and larger GA aircraft.
- Mile High Sky Diving relocated to the western edge of the parcel, in order to reduce impacts to adjacent GA operations.
- Quonset Hut lease (12.5-year) maintained with facility in its current location.
- Include a variety of hangar and apron space (aircraft tie-downs).
- Outline a location for a fuel facility and a wash station.
- Reserve space for a FBO, maintenance facility, and avionics shop.
- Main access to the area shall accommodate light jet aircraft up to Aircraft Design Group (ADG) II and Taxiway Design Group (TDG) 2, with a few smaller taxilanes restricted to ADG I - TDG 1B, in order to allow for a variety of aircraft traffic and for cost and space saving benefits.
- Mix of hangar sizes to accommodate a variety of GA activity including light jets, small turboprop, as well as smaller single-engine piston aircraft.
- Include additional hangars to the eastern side of the parcel, near the existing development, in the vicinity of the electric vault.
- Incorporation of a mainline utility corridor to include appropriate clearances from adjacent facilities and aircraft operational areas.

3.2.1 FAA Design Standards

The LMO Southwest GA Development Area was developed in accordance with horizontal spatial planning requirements, outlined in FAA Advisory Circular (AC) 150/5300-13A *Airport Design*. Additional governing policy integral to formulation of the layout plans is compliance with FAA Federal Regulation Title 14 Part 77 for objects affecting navigable airspace.

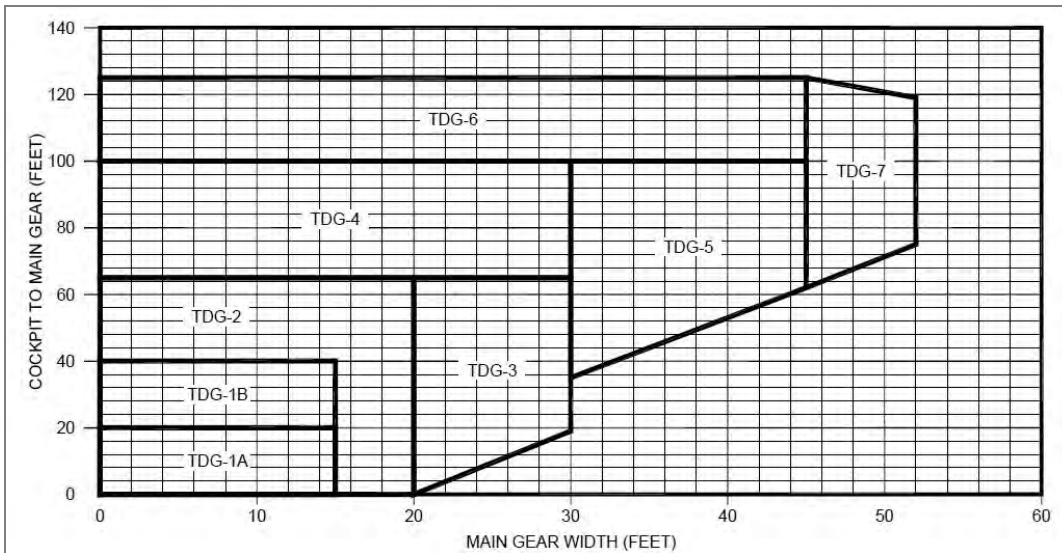
3.2.1.1 FAA AC 150/5300-13A

Taxiway/taxilane pavements are designed in accordance with two governing criteria, including the Airplane Design group (ADG) and the Taxiway Design Group (TDG). ADG is an aircraft classification standard which classifies aircraft based on wingspan and tail height. TDG classifies aircraft based on outer-to-outer main gear width (MGW) and cockpit to main gear distance (CMG).

As noted previously, the development layout plans have been designed to accommodate aircraft as large as light jet aircraft (ADG II), with tail heights between 20 feet and 30 feet, and wingspans between 49 feet and 79 feet. ADG I aircraft are also accommodated, and are defined as those with tail heights less than 20 feet and wingspans less than 49 feet.

Figure 3-1 depicts the TDG categories, based on the main gear width (feet) and cockpit to main gear length (feet).

Figure 3-1. Taxiway Design Group Classification



Main access to the area shall accommodate light jet aircraft up to Aircraft Design Group (ADG) II and Taxiway Design Group (TDG) 2, with a few smaller taxilanes restricted to ADG I - TDG 1B, in order to allow for a variety of aircraft traffic and for cost and space saving benefits. TDG governs the physical dimensions of the taxiway/taxilane pavement, while the ADG outlines the taxiway clearance and taxiway protection standards.

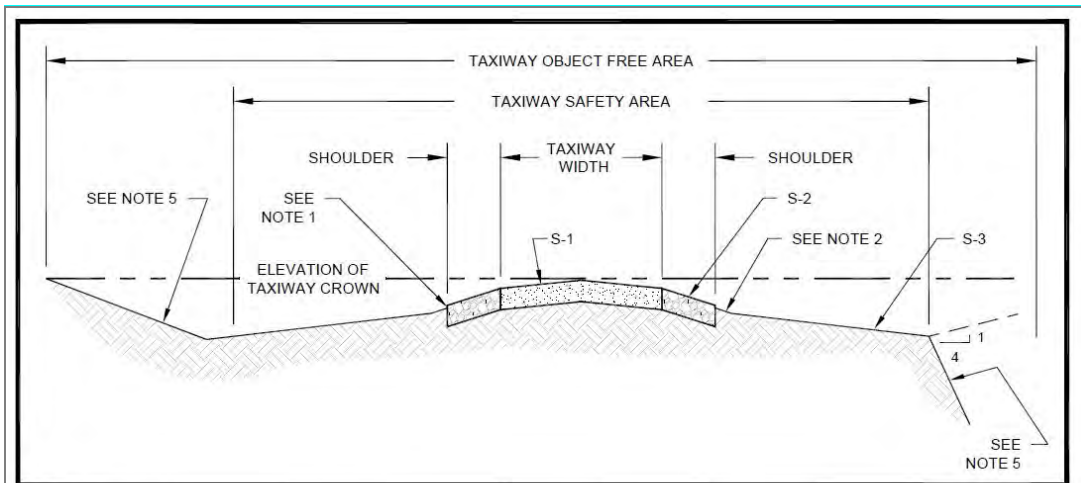
Table 3-1 summarizes the taxiway/taxilane requirements based on the TDG and ADG aircraft classifications applicable to this development plans. Taxiway/taxilane widths and lateral clearances have been planned to meet the requirements outlined in Table 3-1, as derived from FAA AC 150/5300-13A Table 4-1 and Table 4-2.

Table 3-1. Taxiway/Taxilane Requirements

	TDG 2	TDG 1B
Taxiway Width	35'	25'
Taxiway Edge Safety Margin (ESM)	7.5'	5'
Taxiway Shoulder Width	15'	10'
	ADG II	ADG I
Taxiway Safety Area (TSA)	79'	49'
Taxiway Object Free Area (TOFA)	131'	89'
Taxilane Object Free Area (TOFA)	115'	79'
Taxiway Centerline to Fixed or Movable Object	65.5'	44.5'
Taxiway Centerline to Parallel Taxiway/Taxilane Centerline	105'	70'
Taxilane Centerline to Parallel Taxilane Centerline	97'	64'
Taxilane Centerline to Fixed or Movable Object	57.5'	39.5'
Taxiway Wingtip Clearance	26'	20'
Taxilane Wingtip Clearance	18'	15'

Figure 3-2 summarizes taxiway/taxilane transverse grading requirements, in order to maintain positive surface drainage and provide for aircraft safety in the event an aircraft were to leave the pavement surface. For Aircraft Approach Categories A and B, the following standards apply: S-1 = 1.0% - 2.0%; S-2 = 1.5% - 5.0%; S-3 = 1.5% - 5.0%.

Figure 3-2. Transverse Grading Requirements



Notes:

1. Construct a 1.5 inch (4 cm) drop between paved and unpaved surfaces.
2. Maintain a 5.0% grade for 10 feet of unpaved surface adjacent to the paved surface.
3. S-2 applies when shoulders are provided.
4. See Table 3-3 for S-1, S-2, and S-3.
5. The transverse slope from the edge of the TSA should be 0% or negative (unlimited) to the edge of the taxiway OFA if practicable. Allowable positive slope is 4:1.

The FAA has taken a national initiative to reduce the risk of runway incursions and increase the level of airfield safety, by removing and preventing confusing taxiway geometry layouts. The FAA no longer permits taxiway and apron geometries that result in direct access to the runway from taxiways and aprons. The proposed development options avoid the following non-standard conditions:

- **Indirect Access.** Do not design taxiways to lead directly from an apron to a runway, without requiring a turn. Such configurations can lead to confusion when a pilot typically expects to encounter a parallel taxiway, but instead accidentally enters a runway. Options 1 and 2 have been planned to ensure no direct access occurs to Runway 11-29 from the proposed Southwest GA Development Area.
- **Increase visibility.** Right angle intersections, both between taxiways and between taxiways and runways, provide the best visibility to the left and right for a pilot. Acute angle runway exits provide for greater efficiency in runway usage, but should not be used as runway entrance or crossing points. A right angle turn at the end of a parallel taxiway is a clear indication of approaching a runway. Options 1 and 2 have been planned to provide right angle intersections between taxiways and, whenever possible, between taxilanes.

3.2.1.2 FAA Federal Regulation Title 14 Part 77

Part 77 establishes standards to protect the airspace surrounding airports from natural or constructed obstructions that could constitute a hazard to aircraft operations. This is accomplished by defining specific imaginary surfaces around an airport that should not contain any protruding objects. Objects affected include existing or proposed objects of natural growth, terrain, or construction (including equipment, which is permanent or temporary in character). The size of the airspace is dictated by the most precise approach type (visual, non-precision, or precision) existing or planned and the lowest visibility minimum set for each runway end.

For public-use civilian airports, Federal Aviation Regulations (FAR) Part 77 identifies five “imaginary” airport airspace surfaces: Primary Surface, Approach Surface, Transitional Surface, Horizontal Surface, and Conical Surface.

The Building Restriction Line (BRL) is the line indicating where airport buildings must not be located, limiting building proximity to aircraft movement areas. The BRL is set beyond the RPZ, OFZ, OFA, runway visibility zone, NAVAID critical areas, TERPS areas, and ATCT LOS, as applicable. The LMO ALP outlines the position of the 35-foot BRL, which indicates the line beyond which hangars 35-feet high may be built. Hangars were planned beyond the 35-foot BRL limits to avoid Part 77 obstructions.

For planning purposes, the BRL depicted (35-feet) does not account for ground elevation at each hangar site, and is only based on runway centerline elevation. Final maximum allowable hangar height depends on the ground elevation at the hangar site. If the ground elevation is higher than runway centerline elevation, maximum allowable hangar height may be reduced, and conversely. Final allowable hangar height will be determined during final site design of individual hangar developments, based on the site ground elevation. FAA Form 7460-1 *Notice of Proposed Construction or Alteration* will need to be filed and submitted to the FAA for approval, at least 45 days before the start date of construction.

3.2.2 Layout Plan - Option 1

Option 1 depicts an access taxilane (ADG II - TDG 2) parallel to Taxiway B, with two connector taxiways which join to Taxiway B. The connectors accessing the development area are positioned to avoid direct access to the runway from the apron, per FAA criteria.

This alternative includes space for a FBO, two aircraft aprons, as well as a variety of large corporate hangars and T-hangars. The layout plan includes aviation support facilities, including a GA maintenance shop, wash station, fueling apron, and an avionics shop.

Option 1 allows for approximately 205,000 square feet of space for individual hangar area (including space for a maintenance and avionics shop) as well as two 240-foot long T-hangars, one 216-foot long T-Hangar, one 200-foot long T-hangar, three 147-foot long T-hangars, and one 140-foot long T-hangar for a total developable area of approximately 280,000 square feet.

New hangar installations are outlined within the existing eastern t-hangars. A central row of hangars are included at 50 foot wide, with 60-foot lateral clearance on either side. This taxilane width does not meet minimum TL OFA clearance standards (79 feet) for ADG I aircraft, per FAA AC 150/5300-13A Table 4-1. A second row of 60-foot wide hangars is outlined to the east of the existing development, which includes an interior taxilane which meets FAA standards (79 feet).

Further, this alternative depicts non-aeronautical landside development, including automobile parking, landside access roadways, public restroom facilities, and a restaurant located in an easily accessible area in close proximity to the skydiving operations. Skydiving activities and drop zones are located on the western edge of the development area. This option plans for approximately 100,000 square feet of non-aeronautical development, along the roadway.

New airfield pavement total area is approximately 21.4 acres, while new roadways and new automobile parking areas are 2.3 acres and 1.3 acres, respectively.

See Section 3.3 for discussion of the storm drainage layout and Section 3.4 for discussion of the utility corridor design for the Option 1 layout plan.

3.2.3 Layout Plan - Option 2

Option 2 does not include a parallel access taxilane, as outlined in Option 1, but rather it provides three access taxilanes perpendicular to Taxiway B, bordered by conventional hangars, and positioned to avoid direct access to the runway from the apron. Each of the three taxilanes provides access to an area dedicated to T-hangars in the proposed corporate aviation development area. These three taxilanes are planned to ADG II - TDG 2 lateral clearance standards. The smaller general aviation T-hangar array includes taxilanes that are planned to ADG I - TDG 1B aircraft standards, for the smaller aircraft anticipated to use this area.

This alternative includes space for a FBO, two aircraft aprons, as well as a variety of large corporate hangars and T-hangars. The layout plan includes aviation support facilities, including a GA maintenance shop, wash station, fueling apron, and an avionics shop.

Option 2 offers approximately 145,000 square feet of space for individual hangar areas (including space for a maintenance and avionics shop) as well as eleven 200-foot long T-hangars and one 140-foot long T-hangar, for a total developable area of approximately 263,000 square feet. Option 2 includes the proposed hangar installations in the existing eastern development area, as described in the Option 1 summary.

Further, this alternative depicts non-aeronautical landside development, including automobile parking, landside access roadways, public restroom facilities, and a restaurant located in an easily accessible area in close proximity to the skydiving operations. Skydiving activities and drop zones are located to the western edge of the development area. This option plans for approximately 210,000 square feet of non-aeronautical development, along the roadway.

New airfield pavement total area is approximately 21.1 acres, while new roadways and new automobile parking areas are 3.4 acres and 1.7 acres, respectively.

See Section 3.3 for discussion of the storm drainage layout and Section 3.4 for discussion of the utility corridor design for the Option 2 layout plan.

3.2.4 Layout Plan - Options Comparison

The two proposed layout options for the Southwest GA Development Area were analyzed, with assessments of the pros and cons of each, for consideration of a preferred concept development plan.

Option 1 offers more space available for aeronautical development than Option 2, as well as more space available for aircraft tie-downs and apron area. Option 1 also provides for better circulation around the apron area with the possibility for aircraft to complete a loop around the apron, and wash station in the middle of the airfield. Conversely, Option 2 includes cul-de-sac taxilanes, switching from ADG II - TDG 2 near Taxiway B to ADG I - TDG 1B near the T-Hangars areas.

Option 1 provides for a simplified access to the FBO, in close proximity to the current development. The large conventional hangars of Option 1 could be used for private jets or to store several types of aircraft in a mix-use space. Option 2 does not offer large conventional hangars, but depicts various-sized individual hangars to meet demand from a variety of aircraft.

Option 1 plans for less area available for non-aeronautical development than Option 2. In addition, the fueling area and fueling apron depicted in Option 1 are more isolated and farther from the FBO. This could be refined during final design of the development, as fueling facilities could be relocated closer to the FBO and the space planned for the fueling apron could be used instead for based aircraft parking or additional hangar development.

Although both options are flexible and could be easily phased as demand warrants, Option 1 will require more initial capital expense for airfield pavement construction of the proposed Taxiway B parallel taxilane.

Option 1 provides for optimized use of available land area for airside-landside developments, and incorporates all elements desired of the Southwest GA Development Area, including Airport and City feedback, tenant feedback, and LMO MPU projected facility needs.

3.3 Southwest GA Development – Drainage Analysis

Following analysis of the existing site topography, associated storm basins, and surface runoff characteristics (Section 2.2), a preliminary conceptual drainage master plan was developed to mitigate current drainage problems at the Airport and provide an adequate drainage system design for the future build-out of the Southwest GA Development Area. The following outlines recommended permanent stormwater facilities to address water quality, conveyance, and detention requirements as part of the development plan.

3.3.1 Floodplain Impacts

There are two floodplains located within the vicinity of the Southwest GA Development Area. The floodplain to the north is the St. Vrain Creek floodplain. It is a FEMA regulated floodplain and is shown as a Zone AE on the effective FIRM Panel number, 08013C0266J, dated 18 Dec 2012. The City of Longmont has submitted a CLOMR with an updated floodplain delineation, generated from newly adopted flow rates and topography. The new and old St. Vrain Creek floodplain delineations can be found in the Floodplains Map located in Appendix B. Runoff from the Southwest GA Development Area is not conveyed to St. Vrain Creek. Therefore, the St. Vrain Creek floodplain is not affected by the proposed development.

The floodplain to the south of the Airport is the Lykins Gulch floodplain. The Lykins Gulch floodplain is not a FEMA regulated floodplain; however, it is recognized by the City of Longmont as a City sanctioned floodplain. The Lykins Gulch floodplain runs along the southern border of the airport property. The Lykins Gulch floodplain delineation can be found in the Floodplain Map located in Appendix B of this report. Proposed improvements from the Southwest GA Development do not encroach on the Lykins Gulch floodplain. The proposed full-spectrum detention basin will ensure adverse conditions are not created, as a result of the proposed development. The full-spectrum detention basin will treat runoff for water quality and regulate the release rate to equal or less than existing conditions.

3.3.2 Water Quality and Detention

An analysis was completed to explore options for permanent water quality and detention infrastructure, in order to accommodate the proposed Southwest GA Development Plan and existing GA facilities on the south side of the airfield. The analysis discusses best practices for water quality and detention Best Management Practices (BMP), develops preliminary calculations for sizing permanent stormwater facilities, and presents the Airport with four options for locations and types of permanent stormwater facilities.

The four options considered are as follows:

- A. A single full-spectrum detention basin and storm infrastructure for both the proposed development and existing facilities.
- B. Implementation of two detention facilities: new facility for the proposed development and modification of the existing detention basin to support existing GA facilities.
- C. Option 2 without modifications to the existing detention basin.
- D. Installation of underground BMPs.

See Appendix E for the complete *Water Quality and Detention - Drainage Study Memo* (01 December 2016).

Upon review of the analysis findings, the City outlined Option A as the desired approach for storm detention improvements in the Southwest GA Development Area. This is in concurrence with the Consultant's recommendation. Advantages of this options over the other three which were considered are as follows:

- Option A provides the most cost effective location and type of permanent stormwater facility for the Southwest GA Development Area.
- Option A places a full-spectrum detention basin in the area of an existing detention basin to minimize earthwork operations.
- Option A only requires one full-spectrum detention pond for the project, which reduces long-term maintenance costs.
- Option A is located approximately 300 feet from the edge of Runway 11-29, which is reasonable when considering site layout and proximity of existing detention ponds to the runway.

The full-spectrum detention basin expansion and replacement will require that the existing outlet structure be replaced. Other structures including, but not limited to, forebays, trickle channel, micro-pool, emergency spillway, and the access road will also be built as part of the proposed detention basin improvements.

3.3.3 Storm Drainage Analysis

The total site to be developed on Airport property is approximately 70 acres with an estimated imperviousness of 90 percent in the proposed, full build-out condition. The increase in imperviousness of the developed area will create additional runoff and pollutants which will discharge to local waters. The Consultant utilized UDFCD's (Urban Drainage Flood Control District) guidelines for permanent water quality and detention BMP's (Best Management Practices), in order to mitigate any adverse conditions and impacts to waters downstream of the proposed development area.

Two concept development plans were created for the proposed Southwest GA Development Area, as outlined in Section 3.2. Assumptions and procedures used for the development of the proposed drainage system for these two development layout plans are as follows:

- Storm sewer pipe sizes, depth of structures, and ditch capacity approximated using best Engineering judgement.
- The Consultant did not perform a hydrology and hydraulics analysis for the proposed storm system, with the exception of preliminary calculations to size the water quality and detention BMPs.

OPTION 1 SUMMARY

Option 1 utilizes existing site topography and conveys runoff via sheet flow to existing and proposed ditches or proposed inlets in the storm sewer design. Runoff is then conveyed to the full-spectrum detention basin at the east end of the site. Existing cross culverts will remain in place with the exception of the cross culverts connecting the northern drainage ditch. Cross culverts in this ditch will be removed and replaced with larger pipes to accommodate additional flows created from the proposed site development. Proposed cross culverts and proposed storm sewer pipe are shown as blue dashed lines on the Option Layout Plan (Appendix D).

Normal crowns are assumed for all taxilanes, and existing drainage ditches are utilized to the north and south of the site to convey on-site flow. The drainage ditch to the north will need to be enlarged to reach appropriate ditch depths related to cross culvert inverts. Similarly, other existing on-site ditches may require grading operations to daylight proposed cross culverts. It is also assumed that the bottom two feet of the northern ditch will be lined with 9-inch riprap with geotextile fabric to protect from erosion.

OPTION 2 SUMMARY

Option 2 conveys runoff via sheet flow to proposed inlets on the taxilanes or infield areas. Concentrated flows in the storm sewer systems are then conveyed to existing and proposed ditches before entering the full spectrum detention basin at the east end of the site. Existing cross culverts will remain in place with the exception of the cross culverts connecting the northern drainage ditch. Cross culverts in this ditch will be removed and replaced with larger pipes to accommodate additional flows created from the proposed site development. Proposed cross culverts and proposed storm sewer pipe are shown as blue dashed lines on the Option 2 Layout Plan (Appendix D).

Due to the proximity of the taxilanes to the hangars, it is assumed all taxilanes will have a reverse crown section with pavement sloping towards the centerline of the taxilane. Inlets in the taxilanes will need to be designed for airport loading. Option 2 utilizes existing drainage ditches to the north and south to convey on-site flow, similar to Option 1. The drainage ditch to the north will need to be enlarged to reach appropriate ditch depths related to cross culvert inverts. Similarly, other existing on-site ditches may require grading operations to daylight proposed cross culverts. It is also assumed that the bottom two feet of the northern ditch will be lined with 9-inch riprap to protect from erosion.

Option 2 for the proposed development area is more complex than Option 1 from a drainage design and infrastructure layout perspective.

SITE DEVELOPMENT STORM PLANNING

Prior to commencing with individual tenant parcel developments, the following proposed storm remediation infrastructure improvements should be completed:

- Full-spectrum detention basin expansion and replacement.
- North drainage ditch widening and lining

These permanent stormwater facility improvements will need to be completed to address water quality, conveyance, and detention requirements which will be introduced by way of new impervious area and channelized flows from the individual site parcel developments.

3.4 Utility Corridor

A concept-level utility corridor layout was completed to provide utility services to the Southwest GA Development Area. The layout provides for utility extensions from existing mainline utilities and modifications of existing utilities. Utilities include a water line, sanitary sewer line, gas line, communications (phone), fiber optic line, and electrical service. See the *Utility Clearances* exhibit, included with Appendix D, for the lateral and vertical depiction of the utility corridor.

The following design considerations were considered when developing the utility corridor design standards:

City of Longmont, CO Design Standards - 107.10 *Utility Line Separation and Crossings*:

- Maintain a minimum of 3-foot clearance on either side of proposed underground electric facilities.
- All water lines, sanitary sewer mains, and storm sewer mains and laterals shall have a minimum 15-foot separation from existing or proposed structures.
- Water and sewer crossings shall have an minimum 18-inch vertical separation from outside wall to outside wall, with the water line above the sewer line.
- In all cases, bedding material or other structural protection shall be provided to preclude settling and/or failure of the higher pipe.

Longmont Power and Communications Standard Details:

- 36-inch minimum cover over all electrical conduits.

Other design parameters:

- 30-foot minimum corridor width to ensure adequate spacing for proposed utilities, with additional 10-foot clearance to adjacent facilities (40 feet total).
- Utility corridor placed outside Taxiway/Taxilane Object Free Areas to avoid taxiway/taxilane closures for utility access and maintenance needs.
- Minimize utility crossings under pavement.
- Wet utilities must maintain 30-inch minimum cover (LMO frost depth).

Per a phone conversation with the City of Longmont on 16 Feb 2017, the City is requesting additional buffer between each utility as well as between utilities and proposed structures. This results in easier maintenance and provides room for additional utilities to be added in the future. The 30-foot wide corridor meets all clearance requirements listed above and satisfies the additional buffer request from the City.

The gas line maintains a 3-foot min. clearance to the TOFA and 8-foot min. clearance to the sanitary sewer line. The water line meets the minimum 10-foot separation to the sewer and 15-foot clearance from all proposed structures. The power and telecom utilities are located in between the water line and proposed structures, leaving nearly 8 feet on the water side and 10 feet on the building side for any future expansion. The gas and power/telecom utilities will need to be adjusted vertically when they are crossed. All other utilities meet vertical separation requirements and do not need height adjustments to cross each other.

Two options are depicted in the development layout plans for installation of the sanitary sewer line, including a route to the east and a route to the south, to connect to existing sanitary service. Although the southern route is shorter (less expensive), this route may be difficult to pursue as there are currently no easements in place for installation along this southern route.

See the *Utility Clearances* exhibit, included with Appendix D, for the lateral and vertical depiction of the utility corridor.

Additional utility corridor branches are provided in each layout development plan. These branches provide for easier access to the various utilities, especially for proposed tenant plots further away from the main utility corridor. The exact layout of each utility within these branches shall be determined once the types of developments that will need access to them are known. For now, they serve conceptually as an easement to prevent congested development and protect clearances for future utility expansion.

Utility capacity analysis and connection layouts for individual tenants is beyond the scope of this planning study. As unique tenant site development plans are identified, through phased parcel developments, utility needs for these specific prospective tenants will be required as part of their site-civil design Engineering services.

OPTION 1 UTILITY SUMMARY

The utility corridor proposed for Option 1 is outlined to run centrally through the proposed development, just north of the ADG II - TDG 2 Taxilane OFA. This provides ample utility access to all future tenants, while meeting the parameters outlined above. The corridor will end adjacent to the restaurant/non-aeronautical area on the southwest side of the development area.

The proposed 12-inch water line (PFW) is part of a loop system that is tied into the existing 12-inch water main on the south side of the development area, similar to the 8-inch loop at the existing GA development to the east. The size of the water line is driven by Fire Protection of Group I Aircraft Hangars (NFPA 409 Chapter 6). 3,000 GPM is required for the Deluge Foam-Water Sprinkler System and 500 GPM is required for Extra Hazard Hose Stream Allowance. A 12-inch water line is necessary to support the 3,500 GPM total capacity requirement.

The proposed 8-inch sanitary sewer line ties into the existing 12-inch gravity sewer to the east along Airport Road and runs west to the start of the utility corridor near the Rodgers Road cul-de-sac. Sewer connections to most facilities are expected to be 4-inch and connections to large hangars and facilities with more demand are expected to be 6-inch. The main sewer in the utility corridor is sized at an 8-inch diameter to ensure adequate capacity for all potential development needs. Oil separators will be required for hangars, wash station, and fuel station, and shall be taken into consideration during individual parcel site design.

Since the usage of natural gas for each specific site can vary greatly, a 4-inch PE gas line is proposed to match the size of the existing gas service in the region. The 4-inch gas line is designed to tie into the existing gas line by the cul-de-sac.

Longmont Power and Communications shall design the high-voltage electric service to the beginning of the project site upon determination of the power needs, following identification of individual tenant facility types, sizes, and power needs. A transformer is located at the Rodgers Road cul-de-sac, and the underground electric lines enter the utility corridor just before the proposed fence line. Telecom is located adjacent to electric conduit.

OPTION 2 UTILITY SUMMARY

The utility corridor proposed for Option 2 is located towards the southern side of the proposed development area. Before the corridor reaches the west edge of the development, it turns towards the north to serve the skydiving operations, individual box hangars, and wash station. Two utility corridor branches tee off of the main corridor and run northeast to serve the FBO and other proposed facilities closer to Taxiway B. The proposed water system is a double-loop system, outlined to better serve all facilities in the Option 2 layout.

All of the Option 2 mainline utility corridor connections to existing utilities and utility line sizes are proposed to be the same as those outlined in Option 1.

3.5 Fire Protection

The following requirements are to be considered in the final tenant development plan for consideration of fire department access and protection needs:

- Minimum drive aisle of 20-feet for fire department emergency response vehicle access.
- Buildings that are planned to a size of 12,000 square feet or larger shall be required to install a fire protection system.
- All proposed facilities shall be located within 150 feet of fire access routes.
- The aircraft fueling station design will require review and approval by the local fire department, for compliance with fire code and applicable permit acquisitions.

3.6 Natural Resources

The following considerations must be made, prior to developing the Southwest GA Area:

- The proposed development site is home to an active prairie dog colony. The City Wildlife Management Plan (WMP) allows for eradication of the prairie dogs, if fewer than 25 prairie dogs reside within the development limits. If more than 25 prairie dogs exist, they will need to be trapped and relocated to a new approved facility.
- Raptor nest sites are known to exist in and around the proposed development site. The City WMP will need to be considered in addressing the specific species, buffer distances, and seasonal considerations.
- The proposed development site is covered with a thistle infestation. As with any noxious weed, the thistle will need to be treated prior to breaking ground on the development. Thorough eradication of the thistle can take as long as two years, so proper planning and expedited removal of the thistle should be considered.

4.0 Conceptual Construction Cost Estimating

The Consultant's opinion of construction costs for the proposed improvements is included as Appendix F to this report. The following considerations and assumptions were utilized when developing the conceptual cost estimates:

- Cost estimates have been compiled for each of the Southwest GA Development options for the proposed (1) storm drainage infrastructure improvements and (2) mainline utility corridor installation.
- The cost estimates do not include items for individual parcel developments, including: facility construction, mainline utility branch connections, site earthwork excavation and embankment, storm improvements, paving, landscaping, etc.
- Unit pricing is based on recent bid tabulations for similar work on Aviation projects in the state of Colorado and feedback received from the City. Price escalation shall be applied to unit pricing for work completed in 2018 and beyond.
- A bottom-line contingency factor of 10 percent has been applied for unknown potential cost impacts, due to the limited scope of data acquisition for this preliminary planning study.
- The *Storm Improvements (RCP/Inlets)* item outlined in Table 4-1 and Table 4-2 below are the estimated costs for installation of this infrastructure to support the specific development plan detailed in the Option 1 and Option 2 layout plans (Appendix D). Modifications to the layout plan (including facility size/locations, pavement layout, and infield drainage ditches) will require updates to the anticipated summary of costs for this item.
- Unit pricing for utility elements is inclusive of incidentals such as appurtenances, tap fees, and permitting.
- The *Longmont Power and Comm Service Extension Allowance* item lump sum unit price is estimated to cover design and construction for service to be extended from existing services to the proposed development area.
- The utility estimates outline anticipated costs for installation of the mainline utility corridor through the development area, and do not account for potential utility corridor branches to serve individual parcels or development lots.
- The *Electrical/Communications Ductbank (All Inclusive)* item lump sum unit price is estimated to include cable and wire through the 3W CE duct bank.
- The *8-Inch Sanitary Gravity Sewer (All Inclusive)* item is broken out into two items, for both a southern connection and an eastern connection. The SS line installation will incur at least the cost identified in the shorter southern connection. Should the City choose to connect to the east, the additional additive cost identified will be incurred.

4.1 Option 1 Layout Plan - Cost Estimate

The following is a summary breakdown of anticipated construction costs for the Option 1 layout development plan:

Table 4-1. Option 1 Layout Plan Cost Estimate

DESCRIPTION	EXTENDED COST
Storm Infrastructure Improvements	
- Full-Spectrum Detention Basin	\$262,500
- North Drainage Ditch Widening	\$162,900
- Storm Improvements (RCP/Inlets)	\$549,450
Utility Corridor Installation	\$919,050
10% Contingency =	\$189,390
Option 1 Total Estimate =	\$2,083,290

4.2 Option 2 Layout Plan - Cost Estimate

The following is a summary breakdown of anticipated construction costs for the Option 2 layout development plan:

Table 4-2. Option 2 Layout Plan Cost Estimate

DESCRIPTION	EXTENDED COST
Storm Infrastructure Improvements	
- Full-Spectrum Detention Basin	\$262,500
- North Drainage Ditch Widening	\$129,600
- Storm Improvements (RCP/Inlets)	\$639,125
Utility Corridor Installation	\$1,292,300
10% Contingency =	\$232,353
Option 2 Total Estimate =	\$2,555,878

5.0 Consultant's Recommendation

The Consultant recommends Option 1 as the preferred development plan. See Appendix D for the Option 1 and Option 2 layout plan exhibits.

Option 1 provides for optimized use of available land area for airside-landside developments, and incorporates all elements desired of the Southwest GA Development Area, including Airport and City feedback, tenant feedback, and LMO MPU projected facility needs. See Section 3.2.4 for discussion of the pros and cons of each of the two proposed development layout plans.

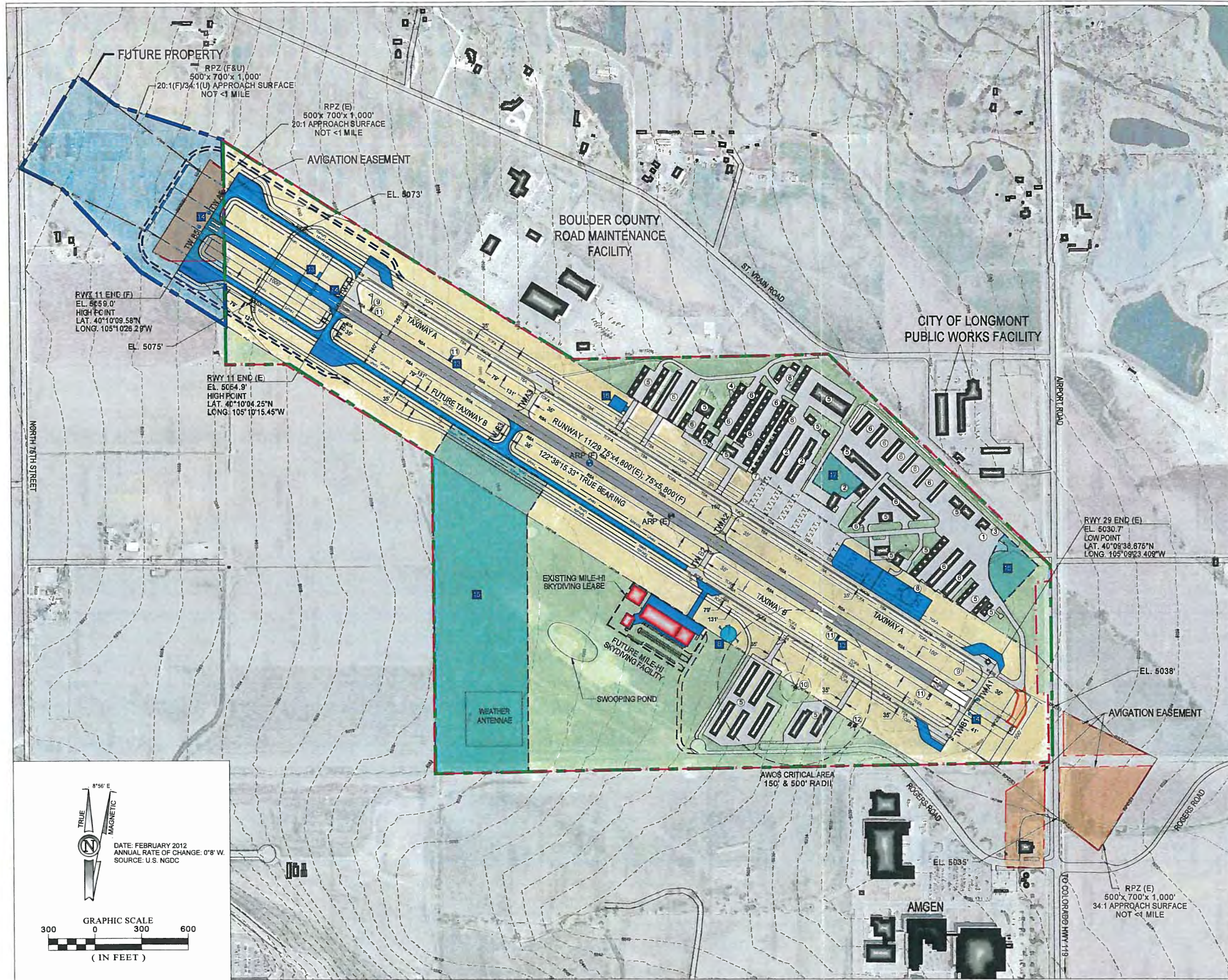
Storm infrastructure improvement requirements are similar for Options 1 and 2. Both development plans require full-spectrum detention basin improvements and widening of the northern drainage swale. These permanent stormwater facility improvements will need to be completed to address water quality, conveyance, and detention requirements, regardless of the specific development plan implemented. Storm capture and conveyance requirements for new inlets and RCP pipe will vary, depending on the specific development plan implemented. The storm improvement costs are anticipated to be comparable for the two proposed layout plans (approx. \$1M), as outlined in Section 4.0.

Both Options 1 and 2 incorporate installation of a mainline utility corridor to include a new gas line, water main, sanitary line, communications (phone), fiber optic line, and electrical service. The location and lengths of the proposed utility lines vary between Options 1 and 2, and are dependent upon the specific development plan implemented. The Option 1 total utility corridor installation cost is anticipated to be 30% less expensive (approx. \$410,000) than the Option 2 installation.

In consideration of all factors for each of the two development plans, including airside-landside operations, storm and utility infrastructure improvement requirements, and associated construction costs, Option 1 is identified as the more optimal solution to meet the Airport's Southwest GA Development needs.

APPENDIX A

LMO ALP and Terminal Area South Plan

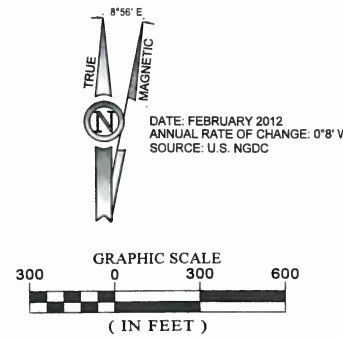


EXISTING	ITEM	FUTURE
	AIRPORT PROPERTY BOUNDARY	
	AVIGATION EASEMENT	
	GROUND CONTOUR	
	PERIMETER FENCE	
	ROAD	
	RUNWAY PROTECTION ZONE (RPZ)	
	RUNWAY SAFETY AREA (RSA)	
	OBJECT FREE AREA (OFA)	
	OBJECT FREE ZONE (OFZ)	
	BUILDINGS	
	BUILDING RESTRICTION LINE (BRL)	
	AIRPORT REFERENCE POINT	
	AIRPORT SURVEY CONTROL POINT	
	AIRFIELD AREA	
	AIRFIELD PAVEMENT	
	REMOVE PAVEMENT	
	AWOS CRITICAL AREA	
	VASI	
	PAPI	
	REIL	
	WINDCONE	
	AWOS	
	ROTATING BEACON	

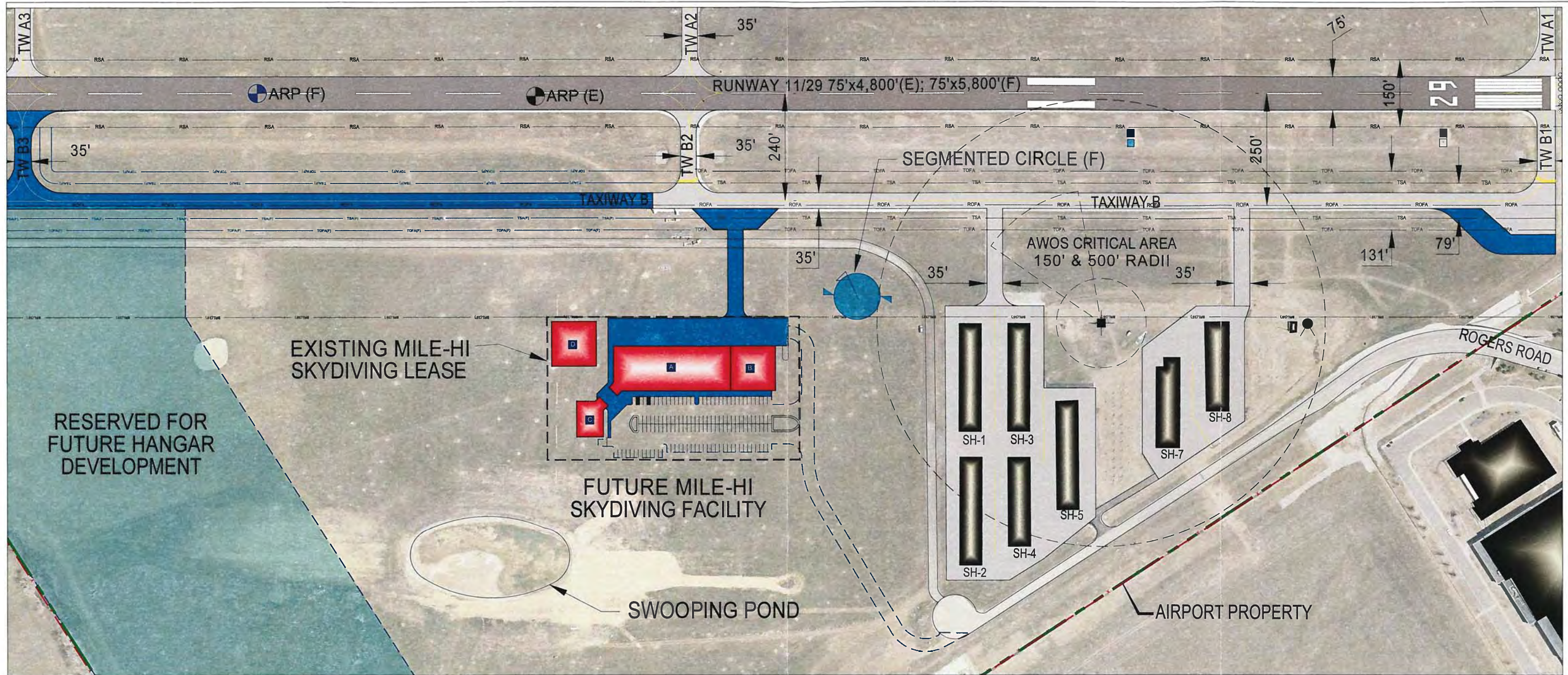
EXISTING	ITEM	FUTURE
①	AIRPORT OFFICE	
②	AIR WEST FLIGHT CENTER (FBO)	
③	TWIN PEAKS AVIATION	
④	MILE-HI SKYDIVING	
⑤	BOX HANGARS	
⑥	T-HANGARS	
⑦	BT ENTERPRISES PORT-A-PORTS	
⑧	SEGMENTED CIRCLE AND WIND CONE	
⑨	WINDCONE	
⑩	AWOS	
⑪	VASI	
⑫	ROTATING BEACON	
	PAPI	
	REIL	
	HANGAR DEVELOPMENT	
	AIRCRAFT/EQUIPMENT WASH PAD	
	GENERAL AVIATION FLIGHT CENTER	

NOTES:
 1. NO THRESHOLD SITTING SURFACE PENETRATIONS
 2. REFER TO SHEET 3 FOR NOTES
 3. REFER TO SHEET 4 FOR TERMINAL AREA
 4. REFER TO SHEET 5 FOR DETAILS RELATED TO F.A.R. PART 77 SURFACES

FAA APPROVAL	SPONSOR APPROVAL
SUBJECT TO LETTER DATED _____	ACCEPTED: VANCE BRAND MUNICIPAL AIRPORT JOINT POWERS BOARD
FEDERAL AVIATION ADMINISTRATION DENVER AIRPORTS DISTRICT OFFICE	DATE _____
DATE: _____	
CASE NO. _____	



		VANCE BRAND MUNICIPAL AIRPORT LONGMONT, COLORADO AIRPORT LAYOUT PLAN	DES: JMG		ISSUE RECORD		AIRPORT LAYOUT PLAN	SHEET NO. 2 of 13
			DR: LMR	CH: CJB	APP: TLV	NO.		
			DRAFT					
			AIP PROJ. NO. 3-08-0040-12		JV AVIATION PROJ. NO. LMO AIP-12		DATE: FEBRUARY 18, 2012	



BUILDING AND FACILITIES LEGEND

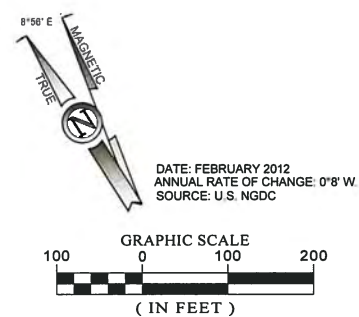
BUILDING NO.	TYPE OF BUILDING	EST. HT. FEET
SH-1	T-HANGARS	22'
SH-2	T-HANGARS	22'
SH-3	T-HANGARS	22'
SH-4	T-HANGARS	22'
SH-5	T-HANGARS	22'
SH-6	T-HANGARS	22'
SH-7	T-HANGARS	22'
SH-8	T-HANGARS	22'

FUTURE FACILITIES LIST

FACILITY NO.	FACILITY DESCRIPTION	BUILD. SIZE(SF)	TYPE OF BUILDING	EST. HT. FEET
A	MILE-HI SKYDIVING FACILITY	26,355	HANGAR	N/A
B	MILE-HI SKYDIVING FACILITY	10,042	HANGAR	N/A
C	MILE-HI SKYDIVING FACILITY	10,042	HANGAR	N/A
D	MILE-HI SKYDIVING FACILITY	4,850	HANGAR	N/A

DRAWING LEGEND

EXISTING	ITEM	FUTURE
	AIRPORT PROPERTY BOUNDARY	
	PERIMETER FENCE	
	ROAD	
	RUNWAY SAFETY AREA (RSA)	
	OBJECT FREE AREA (OFA)	
	OBJECT FREE ZONE (OFZ)	
	BUILDINGS	
	BUILDING RESTRICTION LINE (BRL)	
	AIRFIELD PAVEMENT	
	VASI	
	PAPI	
	AWOS	
	ROTATING BEACON	



JVIATION



VANCE BRAND MUNICIPAL AIRPORT
LONGMONT, COLORADO
AIRPORT LAYOUT PLAN

DES: JMG
DR: LMR
CH: CJB
APP: TLV

ISSUE RECORD			
NO.	BY	DATE	DESCRIPTION
DRAFT			

**TERMINAL AREA PLAN
SOUTH**

AIP PROJ. NO. 3-08-0040-12

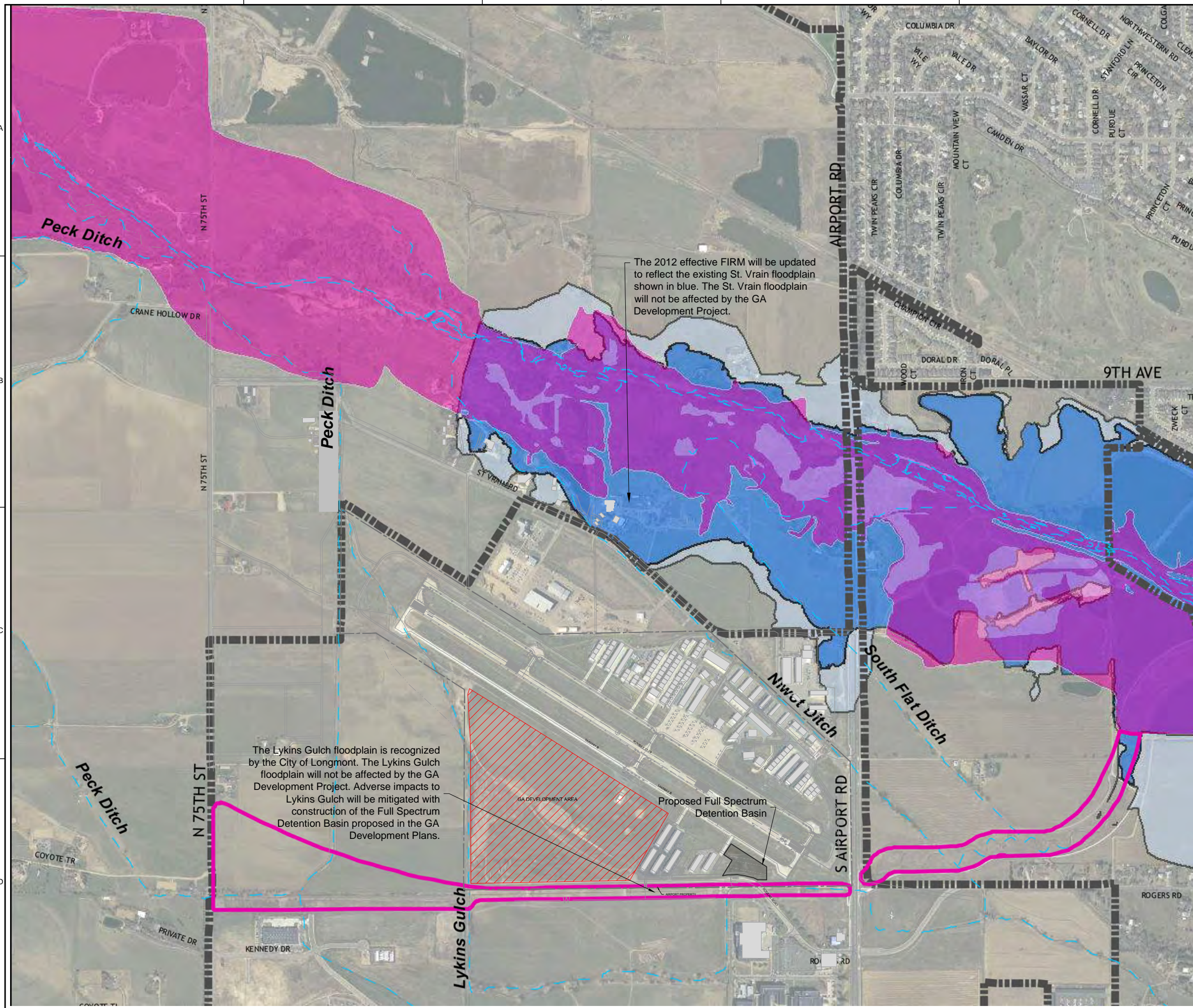
JVIATION PROJ. NO. LMO AIP-12

DATE: FEBRUARY 18, 2012

SHEET NO.
5 of 13

APPENDIX B

LMO SW GA Existing Conditions



The 2012 effective FIRM will be updated to reflect the existing St. Vrain floodplain shown in blue. The St. Vrain floodplain will not be affected by the GA Development Project.

The Lykins Gulch floodplain is recognized by the City of Longmont. The Lykins Gulch floodplain will not be affected by the GA Development Project. Adverse impacts to Lykins Gulch will be mitigated with construction of the Full Spectrum Detention Basin proposed in the GA Development Plans.

- Legend**
- City of Longmont Lykins Gulch 100yr flood plain
 - City of Longmont Spring Gluch 2 100yr flood plain
 - gis.POLITICAL Longmont_City_Limit
 - DECEMBER 2012 FIRM**
 - AE - FLOODWAY
 - A - 100-year flood plain
 - AE - 100-year flood plain
 - AH - 100-year flood plain
 - AO - 100-year flood plain
 - X - 500-year flood plain
 - X - outside 100- & 500-year flood plains
 - X - protected by levee
 - NEW EXISTING 100 YR
 - NEW EXISTING 500 YR



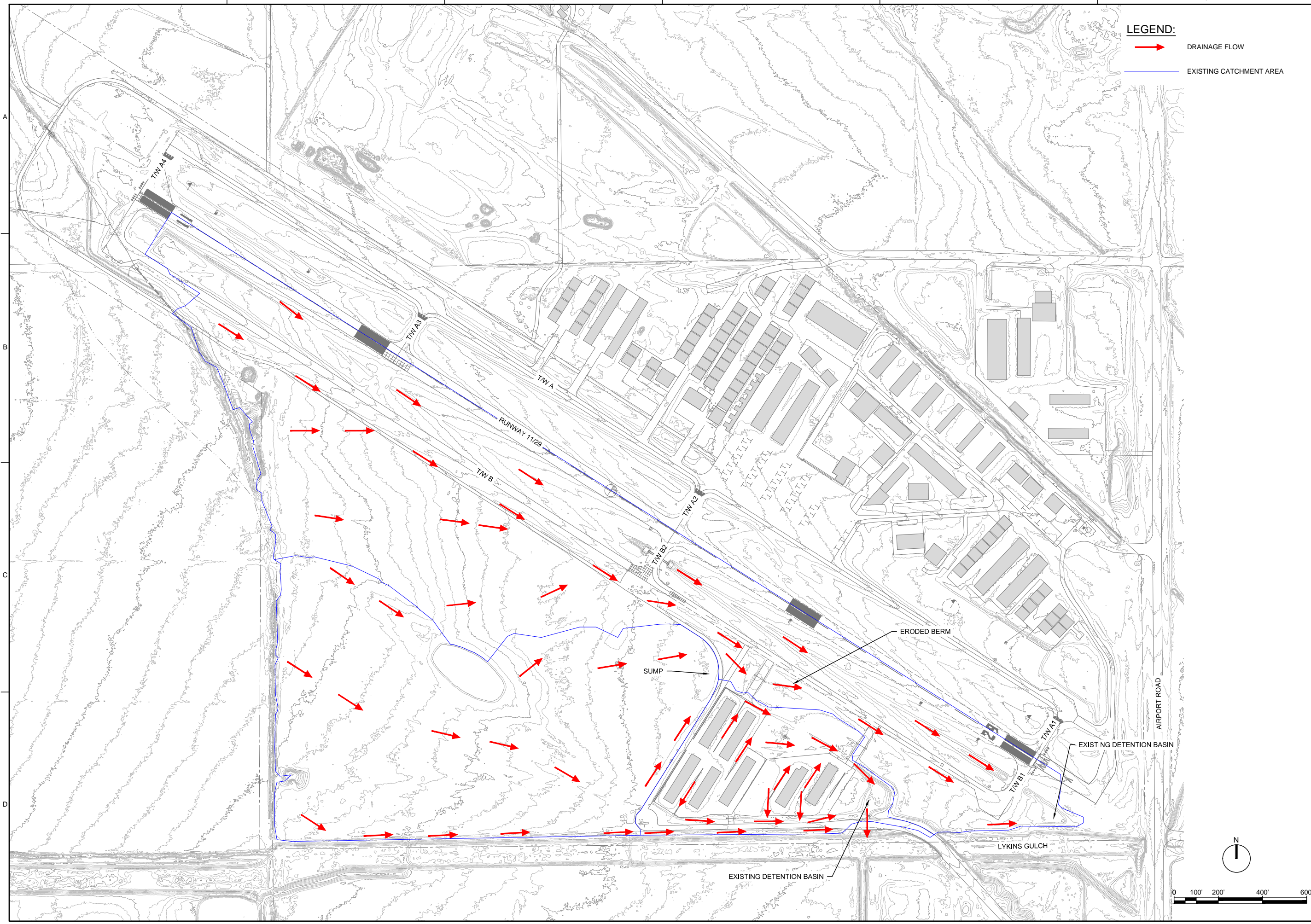
NO.	DATE	REVISION	BY	APVD	CP



SOUTHWEST GA DEVELOPMENT PLAN
 VANCE BRAND MUNICIPAL AIRPORT
 CITY OF LONGMONT, CO


ch2m

FLOODPLAINS

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING	
DATE	JAN 2017
PROJ	679272
DWG	Floodplain
SHEET	05 of 05



LEGEND:
 DRAINAGE FLOW
 EXISTING CATCHMENT AREA

		SOUTHWEST GA DEVELOPMENT PLAN VANCE BRAND MUNICIPAL AIRPORT CITY OF LONGMONT, CO	
		EXHIBIT: EXISTING DRAINAGE BASINS AND SURFACE FLOW PATTERNS	
VERIFY SCALE			
BAR IS ONE INCH ON ORIGINAL DRAWING.			
DATE	JAN 2017		
PROJ	679272		
DWG	CB101		
SHEET	of		

NO.	DATE	REVISION	BY
DSGN	JS	DR	APVD
BB	CHK	JT	CP

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LEGEND:

- PFW WATER (FORCE MAIN)
- SAG SANITARY SEWER (GRAVITY MAIN)
- NGS NATURAL GAS
- UGE UNDERGROUND ELECTRIC (POWER)
- - - AIRPORT PROPERTY LINE



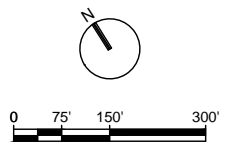
A
B
C
D

CP	BY	APVD
BB	CHK	APVD
DR	JT	APVD
DJG	NO.	DATE
DJG	NO.	DATE
DJG	NO.	DATE
DJG	NO.	DATE
DJG	NO.	DATE
DJG	NO.	DATE
DJG	NO.	DATE
DJG	NO.	DATE

SOUTHWEST GA DEVELOPMENT PLAN
VANCE BRAND MUNICIPAL AIRPORT
CITY OF LONGMONT, CO

ch2m
EXISTING UTILITY MAP

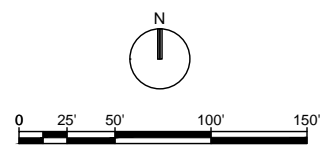
VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	MARCH 2017
PROJ	679272
DWG	Existing Utilities
SHEET	06 of 06



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APPENDIX C

LMO SW GA Parcel Map



ch2m

PARCEL MAP

SOUTHWEST GA DEVELOPMENT PLAN
 VANCE BRAND MUNICIPAL AIRPORT
 CITY OF LONGMONT, CO

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	MARCH 2017
PROJ	679272
DWG	Parcel Map
SHEET	01 of 06

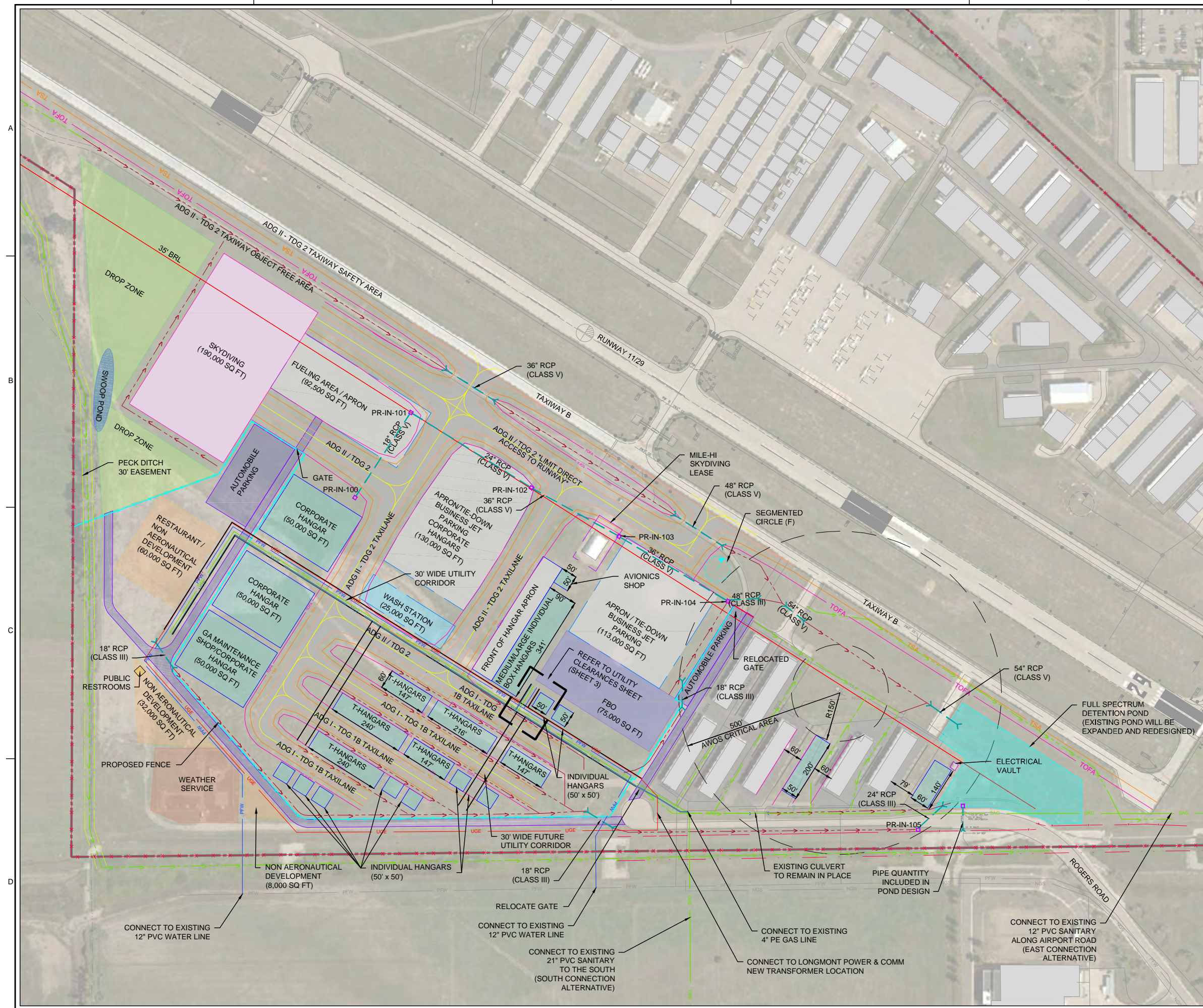
NO.	DATE	DR	CHK	BY	CP
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APPENDIX D

LMO SW GA Development Layout Plans

1 2 3 4 5 6



- LEGEND:**
- PFW — 12-INCH WATER (FORCE MAIN)
 - SAG — 8-INCH SANITARY SEWER (GRAVITY MAIN)
 - UGE — UNDERGROUND ELECTRIC/TELECOM
 - NGS — 4-INCH NATURAL GAS
 - - - PROPOSED RCP
 - - - EXISTING RCP
 - - - PROPOSED DRAINAGE DITCH
 - - - EXISTING DRAINAGE DITCH
 - TSA — TAXIWAY/TAXILANE SAFETY AREA
 - TOFA — TAXIWAY/TAXILANE OBJECT FREE AREA
 - DRAINAGE INLET (PR-IN-XXX)
 - FENCE
 - AIRPORT PROPERTY

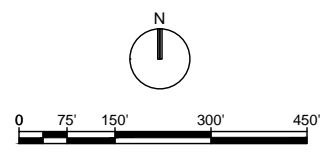
CP									
BY	APVD								
REVISION	CHK	BB							
DR	JV, RM, JS								
NO.	DATE								
DSGN									

SOUTHWEST GA DEVELOPMENT PLAN
 VANCE BRAND MUNICIPAL AIRPORT
 CITY OF LONGMONT, CO

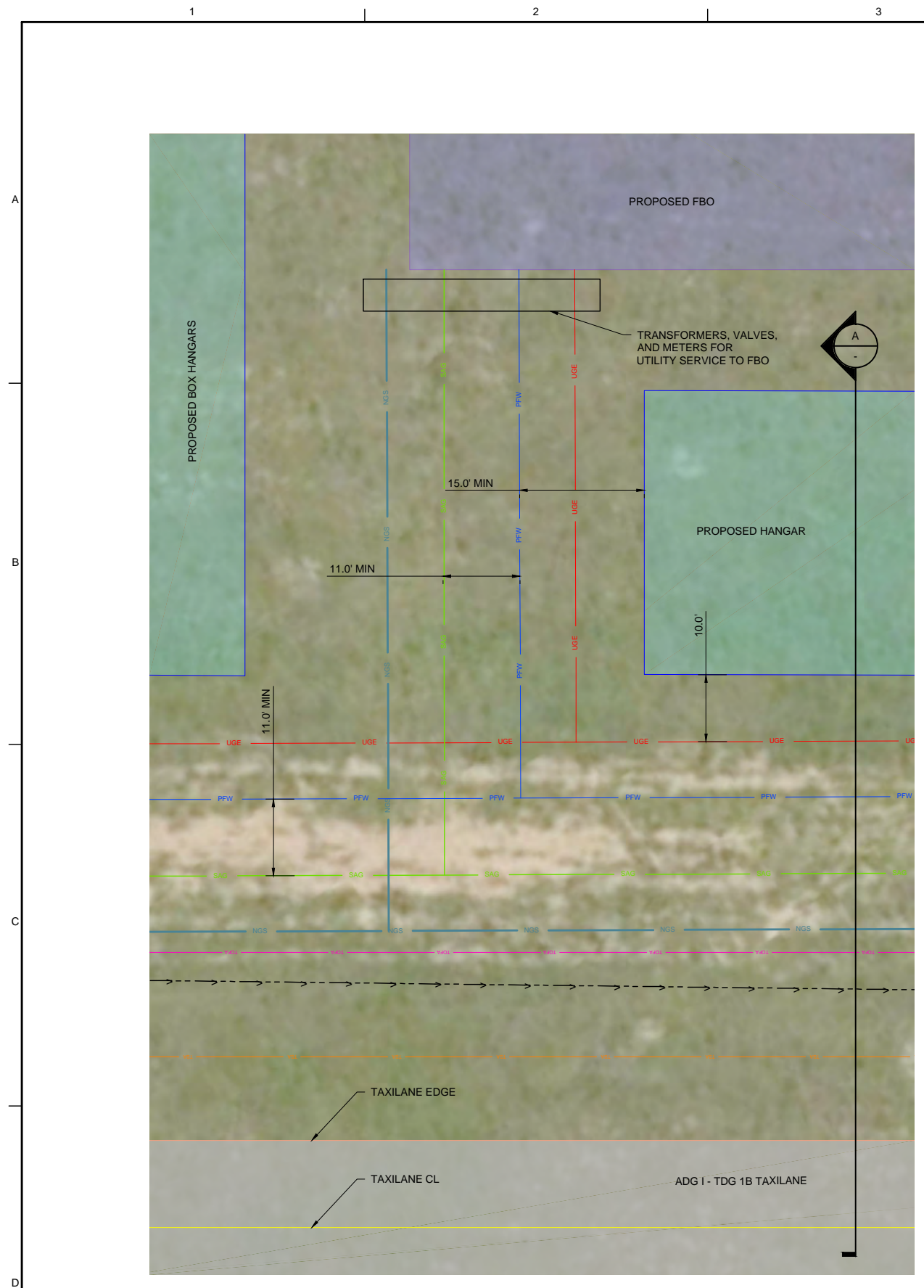
ch2m

LAYOUT PLAN - OPTION 1

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	MARCH 2017
PROJ	679272
DWG	Option 1
SHEET	02 of 06



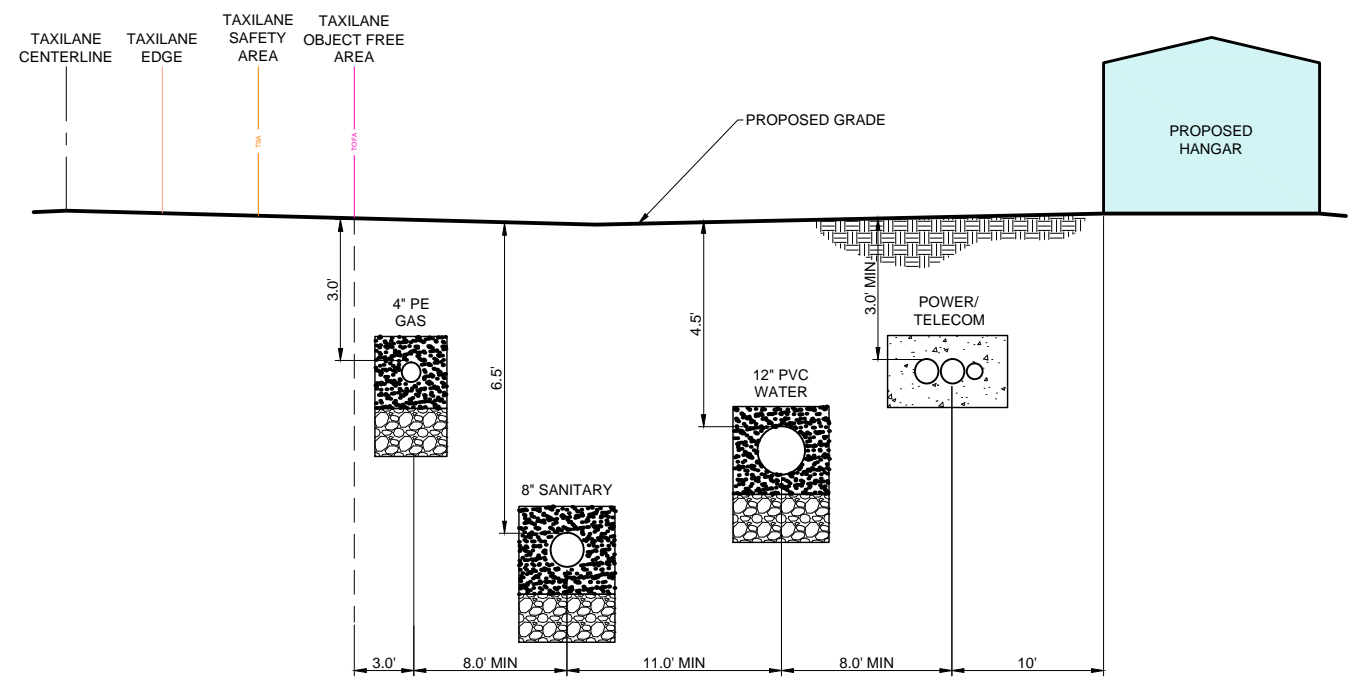
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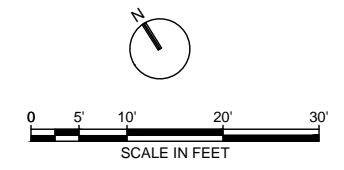
PLAN
1" = 10'

LEGEND:

- PFW 12-INCH WATER (FORCE MAIN)
- SAG 8-INCH SANITARY SEWER (GRAVITY MAIN)
- UGE UNDERGROUND ELECTRIC/TELECOM
- NGS 4-INCH NATURAL GAS
- TSA TAXILANE SAFETY AREA
- TOFA TAXILANE OBJECT FREE AREA



A SECTION
NOT TO SCALE



NO.	DATE	DR	REVISION	BY	CP

SOUTHWEST GA DEVELOPMENT PLAN
VANCE BRAND MUNICIPAL AIRPORT
CITY OF LONGMONT, CO

ch2m

UTILITY CLEARANCES

VERIFY SCALE	BAR IS ONE INCH ON ORIGINAL DRAWING.
DATE	MARCH 2017
PROJ	679272
DWG	Utility Clearances
SHEET	03 of 06

1 2 3 4 5 6



- LEGEND:**
- PFW 12-INCH WATER (FORCE MAIN)
 - SAG 8-INCH SANITARY SEWER (GRAVITY MAIN)
 - UGE UNDERGROUND ELECTRIC/TELECOM
 - NGS 4-INCH NATURAL GAS
 - - - PROPOSED RCP
 - - - EXISTING RCP
 - - - PROPOSED DRAINAGE DITCH
 - - - EXISTING DRAINAGE DITCH
 - TSA TAXIWAY/TAXILANE SAFETY AREA
 - TOFA TAXIWAY/TAXILANE OBJECT FREE AREA
 - DRAINAGE INLET
 - - - FENCE
 - - - AIRPORT PROPERTY

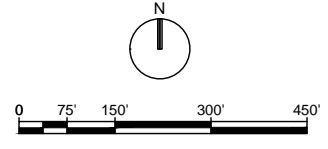
CP					
BY	APVD				
REVISION	CHK	BB			
DR	JT				
J.V. RM. JS					
NO.	DATE				
DSGN					

SOUTHWEST GA DEVELOPMENT PLAN
 VANCE BRAND MUNICIPAL AIRPORT
 CITY OF LONGMONT, CO

ch2m

LAYOUT PLAN - OPTION 2

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	MARCH 2017
PROJ	679272
DWG	Option 2
SHEET	04 of 06



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APPENDIX E

LMO SW GA Stormwater Detention Analysis

Vance Brand Municipal Airport Southwest GA Development Area – Drainage Study Memo

PREPARED FOR: Chad Picard
 PREPARED BY: Justin Shintaku, PE
 DATE: December 1, 2016
 PROJECT NUMBER: 679272

Introduction

This technical memorandum is written to summarize four options for permanent water quality and detention required to accommodate proposed and existing development of the LMO Southwest General Aviation Development Area. The memo only outlines options for water quality and detention facilities. Once direction is given to CH2M on the desired configuration for these facilities the layout for the rest of the stormwater pipe networks and drainage features can commence.

Design Criteria

The purpose of this memo is to address adverse impacts to water quality and site discharge on receiving waters created by increased runoff and pollutants from the proposed airport development. In a phone conversation with a representative from the City of Longmont’s Stormwater Quality Division, Judah Gaioni, on November 29, 2016 it was conveyed that the City of Longmont’s MS4 Permit does not include the airport. The CDPHE MS4 Urban Areas Map confirms that the airport is not within the City’s jurisdiction. The City has adopted UDFCD’s (Urban Drainage Flood Control District) guidelines for the design of permanent stormwater facilities. Although the airport is not within the City’s jurisdiction, Judah recommended that the airport follow UDFCD’s guidelines to keep consistency in the area. CH2M also recommends using UDFCD’s guidelines.

Permanent Water Quality and Detention BMPs

The BMPs (Best Management Practices) for permanent water quality and detention facilities recommended for this project are in accordance with UDFCD’s Best Management Practice Design Manual. The total project site to be developed on the airport property is approximately 70 acres with an estimated imperviousness of 90% in the proposed, full build out condition. UDFCD recommends an approach termed “full spectrum detention” to size BMP for water quality and detention. Full spectrum detention is intended to reduce the flooding and stream degradation impacts associated with urban development by controlling peak flows in the stream for a range of events. The UDFCD Full Spectrum Detention UD-Detention v3.06.xls spreadsheet yields values in Table 1 for approximate detention volumes for the entire proposed and existing Southwest GA Development Area. Four options are presented below for selection and placement of permanent stormwater facilities.

Zone	Description	Volume	Unit
Zone 1	WQCV (Water Quality Capture Volume)	2.34	acre-feet
Zone 2	EURV (Excess Urban Runoff Volume) - Zone 1	3.91	acre-feet
Zone 3	100-year - Zones 1 & 2	4.11	acre-feet
	Total Detention Basin Volume	10.36	acre-feet

Option 1

Exhibit 1 illustrates an optimal location for a full spectrum detention basin when considering existing drainage patterns within the basin, existing development, and available area. The project site slopes from west to east with the natural low point at the location of the proposed full spectrum detention basin. From Google Earth images and existing survey it appears there is currently an existing detention basin in this location. The existing detention basin will need to be upsized to accommodate additional runoff from the proposed development upstream. However, earthwork operations will be minimized by taking advantage of the existing sump. According to UDFCD's guidelines, full spectrum detention basins also include a forebay, trickle channel, micropool, emergency spillway and access road that will need to be built as part of the existing pond expansion. All the proposed extended detention basins discussed in this memo will be dry most of the time and will drain within 40 hours after storm events per UDFCD guidelines.

Option 2

Exhibit 2 illustrates two full spectrum detention basins; one to provide water quality and detention for the proposed development and one to provide water quality and detention for the existing development east of the cul-de-sac. The rationale for this configuration is to maintain a smaller pond to the east at the location of the existing pond and add a new pond located farther away from the runway. Option 2 will be more expensive and require more maintenance for the airport (two ponds instead of one), but will have the same amount of surface water during storm events near the runway, as in the existing condition. Due to existing grades it is not feasible to pipe runoff from the existing development back to the west pond. In this scenario the existing pond to the east would also need improvements to meet UDFCD guidelines including a forebay, trickle channel, micropool, emergency spillway and access road.

Option 3

Option 3 is basically the same configuration as Option 2 with the exception that no modifications would be made to the existing detention basin.

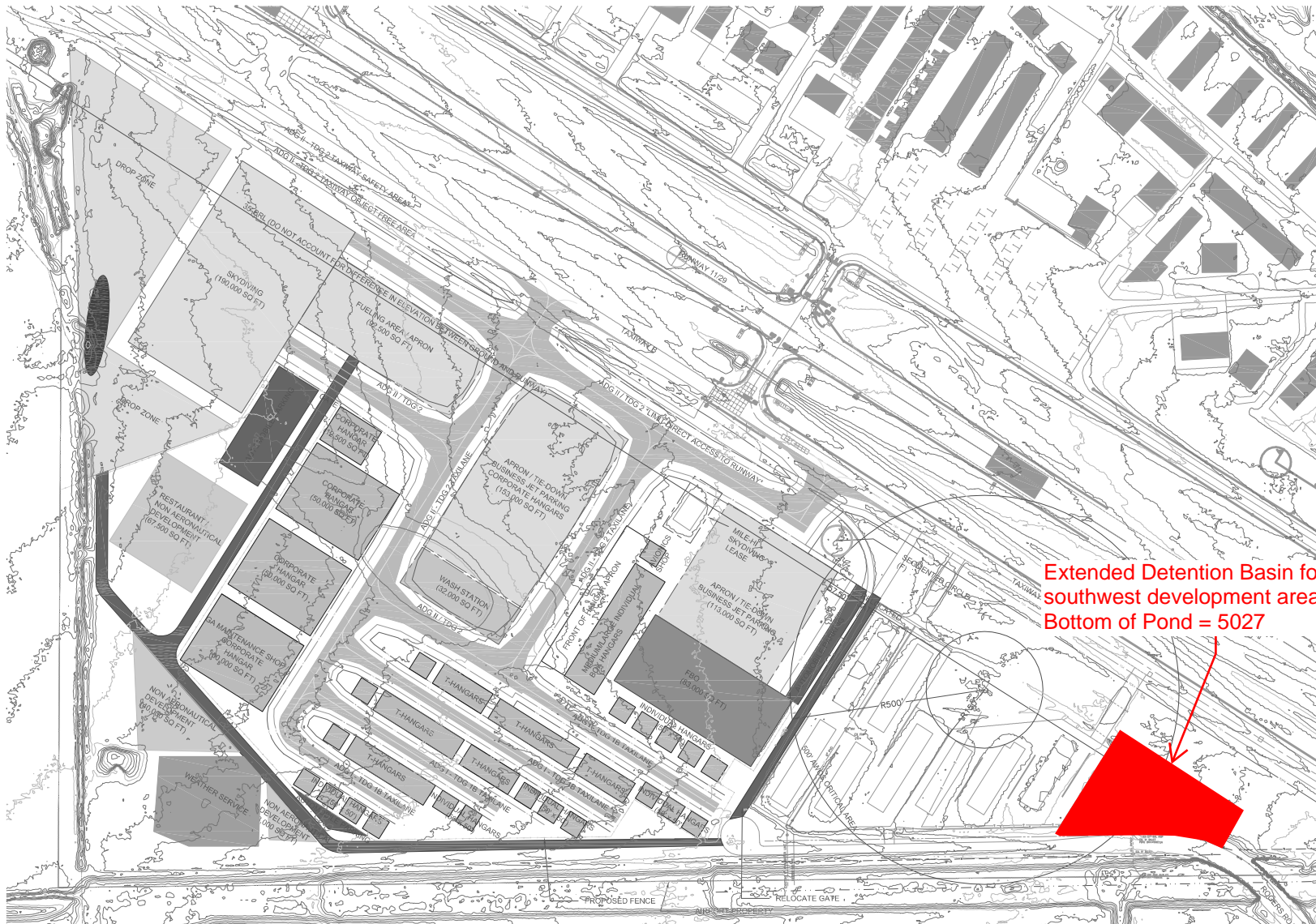
Option 4

Option 4 explores the possibility of utilizing Underground BMPs. Underground BMPs are devices installed below ground that provide stormwater quality treatment. An example of an underground BMP would be a sizable underground storage vault that serves the same purpose as an above ground water quality and detention pond. UDFCD guidelines and the City of Longmont both discourage the use of Underground BMPs due to several factors including problems with unmaintained or poorly maintained devices, remobilization by wash-out (scour) of accumulated pollutants during larger events, lack of performance data for underground devices in the region and cost. However, this option would eliminate temporary standing surface water in the vicinity of the runway after storm events.

Recommendation

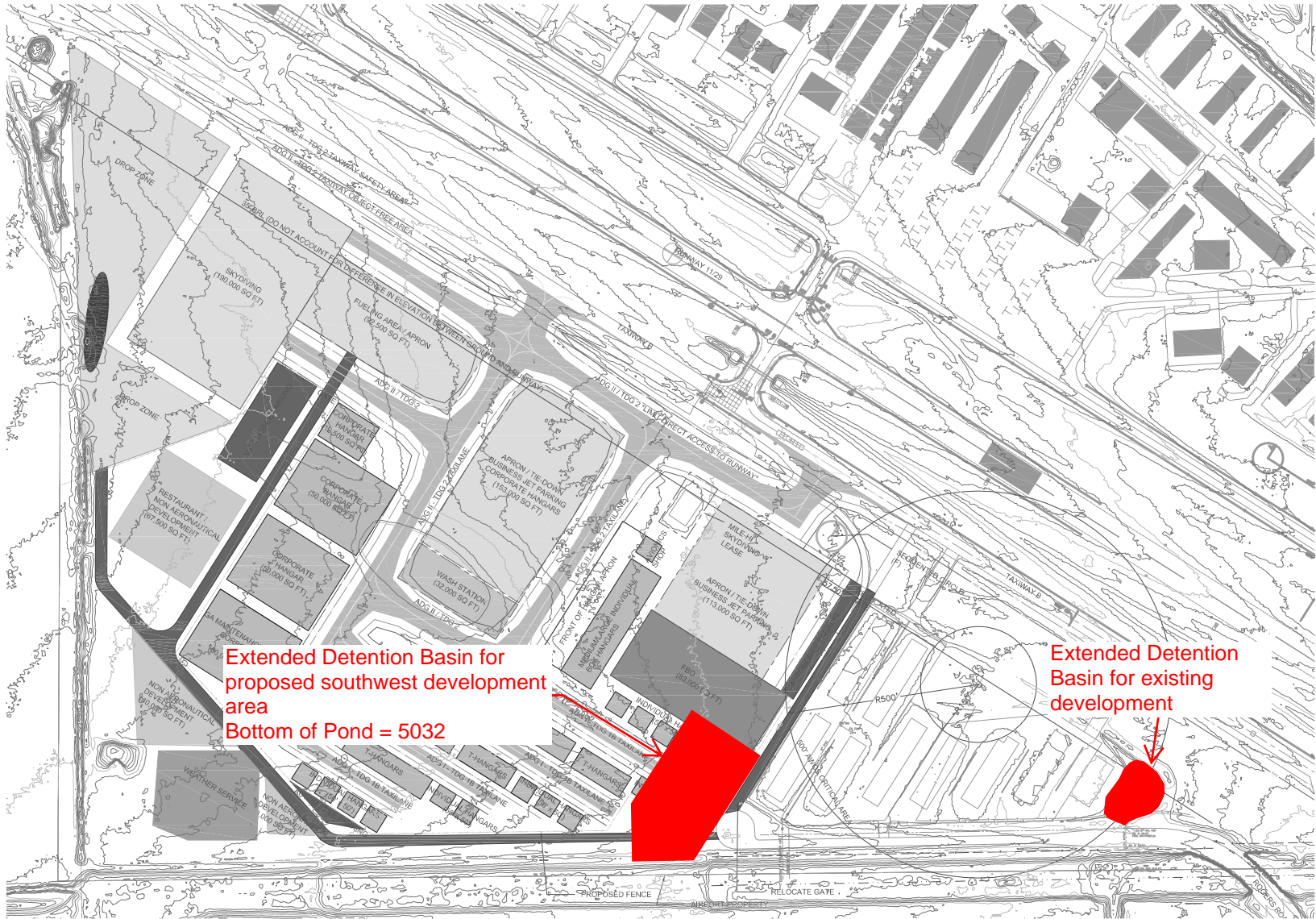
CH2M recommends Option 1 as the most feasible and cost effective location for the permanent water quality and detention BMP. The full spectrum detention basin will be dry most of the time and will drain within 40 hours after storm events per UDFCD guidelines.

Exhibit 1



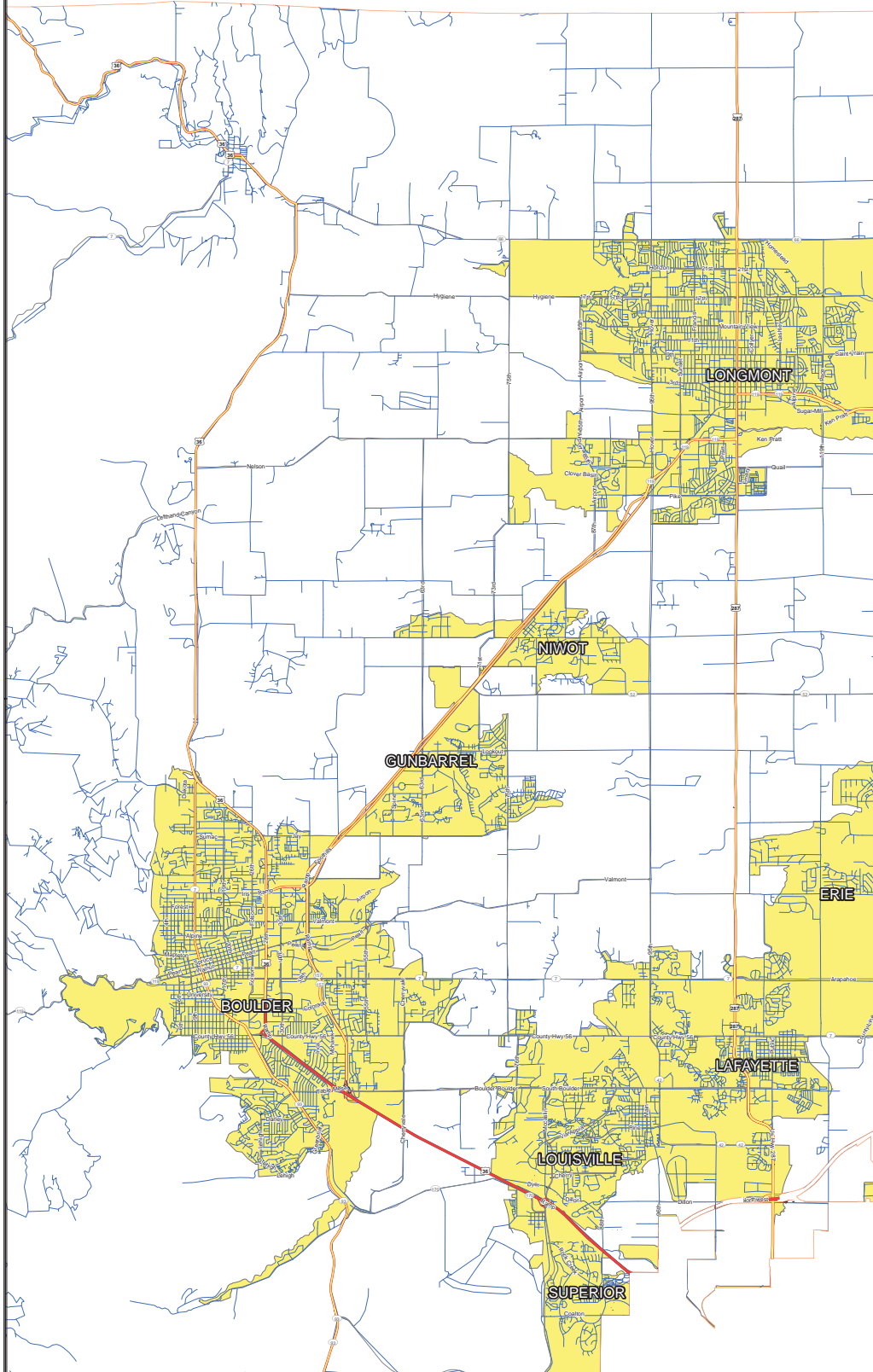
Scale: 1" = 400'

Exhibit 2



Scale: 1" = 400'

Boulder County Urban Area



APPENDIX F

Conceptual Construction Cost Estimates

Vance Brand Municipal Airport
Southwest GA Development Area - Planning Study
Conceptual Construction Cost Estimate
March 2017

OPTION 1	Extended Cost
Storm Infrastructure Improvements	\$ 974,850.00
Utility Corridor Installation	\$ 919,050.00
Subtotal =	\$ 1,893,900.00
Contingency (10%)	\$ 189,390.00
TOTAL =	\$ 2,083,290.00

OPTION 2	Extended Cost
Storm Infrastructure Improvements	\$ 1,031,225.00
Utility Corridor Installation	\$ 1,292,300.00
Subtotal =	\$ 2,323,525.00
Contingency (10%)	\$ 232,353.00
TOTAL =	\$ 2,555,878.00

**VANCE BRAND MUNICIPAL AIRPORT
SOUTHWEST GA DEVELOPMENT AREA
PLANNING STUDY
CONCEPTUAL CONSTRUCTION COST ESTIMATE
MARCH 2017**

OPTION 1 - STORM INFRASTRUCTURE IMPROVEMENTS					
ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	EXTENDED COST
1	Unclassified Excavation (Complete In-Place)	CY	10,000	\$ 10.00	\$ 100,000.00
2	Geotextile (Erosion Control) (Class 1)	SY	4,300	\$ 3.00	\$ 12,900.00
3	Riprap (9-Inch)	CY	2,000	\$ 25.00	\$ 50,000.00
4	18-Inch Reinforced Concrete Pipe (Complete In-Place) (Class III)	LF	264	\$ 100.00	\$ 26,400.00
5	18-Inch Reinforced Concrete Pipe (Complete In-Place) (Class V)	LF	305	\$ 125.00	\$ 38,125.00
6	24-Inch Reinforced Concrete Pipe (Complete In-Place) (Class III)	LF	105	\$ 135.00	\$ 14,175.00
7	24-Inch Reinforced Concrete Pipe (Complete In-Place) (Class V)	LF	430	\$ 150.00	\$ 64,500.00
8	36-Inch Reinforced Concrete Pipe (Complete In-Place) (Class V)	LF	860	\$ 200.00	\$ 172,000.00
9	48-Inch Reinforced Concrete Pipe (Complete In-Place) (Class III)	LF	95	\$ 250.00	\$ 23,750.00
10	48-Inch Reinforced Concrete Pipe (Complete In-Place) (Class V)	LF	175	\$ 300.00	\$ 52,500.00
11	54-Inch Reinforced Concrete Pipe (Complete In-Place) (Class V)	LF	170	\$ 400.00	\$ 68,000.00
12	18-Inch Reinforced Concrete End Section	EA	6	\$ 1,250.00	\$ 7,500.00
13	24-Inch Reinforced Concrete End Section	EA	1	\$ 1,500.00	\$ 1,500.00
14	36-Inch Reinforced Concrete End Section	EA	2	\$ 1,750.00	\$ 3,500.00
15	48-Inch Reinforced Concrete End Section	EA	3	\$ 2,500.00	\$ 7,500.00
16	54-Inch Reinforced Concrete End Section	EA	4	\$ 3,500.00	\$ 14,000.00
17	Inlet Type C (5-Foot)	EA	2	\$ 5,000.00	\$ 10,000.00
18	Inlet Type C (10-Foot)	EA	1	\$ 7,500.00	\$ 7,500.00
19	Inlet Type D (10-Foot)	EA	3	\$ 10,000.00	\$ 30,000.00
20	Full-Spectrum Detention Basin	AC-FT	10.5	\$ 25,000.00	\$ 262,500.00
21	Erosion Control	LS	1	\$ 3,500.00	\$ 3,500.00
22	Demolition - Roadway and Drainage	LS	1	\$ 5,000.00	\$ 5,000.00
\$					974,850.00

NOTES

North drainage ditch widening
North drainage ditch lining
North drainage ditch erosion control (2-foot thickness along channel bottom)

Structures: PR-IN-100, PR-IN-101
Structures: PR-IN-105
Structures: PR-IN-102, PR-IN-103, PR-IN-104

OPTION 1 - UTILITY CORRIDOR					
ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	EXTENDED COST
1	Longmont Power and Comm Service Extension Allowance	LS	1	\$ 265,000.00	\$ 265,000.00
2	Electrical/Communications Ductbank (All Inclusive)	LF	4,000	\$ 35.00	\$ 140,000.00
3	4-Inch PE Gas Pipeline (All Inclusive)	LF	2,010	\$ 40.00	\$ 80,400.00
4	12-Inch PVC Watermain (All Inclusive)	LF	3,165	\$ 60.00	\$ 189,900.00
5	8-Inch Sanitary Gravity Sewer (All Inclusive) South Connection	LF	2,770	\$ 65.00	\$ 180,050.00
6	8-Inch Sanitary Gravity Sewer (All Inclusive) East Connection Additional Length	LF	980	\$ 65.00	\$ 63,700.00
\$					919,050.00

Jeff Winston quote [email 28 Dec 2016]

Bill Taylor quote
Bill Taylor quote

**VANCE BRAND MUNICIPAL AIRPORT
SOUTHWEST GA DEVELOPMENT AREA
PLANNING STUDY
CONCEPTUAL CONSTRUCTION COST ESTIMATE
MARCH 2017**

OPTION 2 - STORM INFRASTRUCTURE IMPROVEMENTS					
ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	EXTENDED COST
1	Unclassified Excavation (Complete In-Place)	CY	8,000	\$ 10.00	\$ 80,000.00
2	Geotextile (Erosion Control) (Class 1)	SY	3,200	\$ 3.00	\$ 9,600.00
3	Riprap (9-Inch)	CY	1,600	\$ 25.00	\$ 40,000.00
4	18-Inch Reinforced Concrete Pipe (Complete In-Place) (Class III)	LF	155	\$ 100.00	\$ 15,500.00
5	18-Inch Reinforced Concrete Pipe (Complete In-Place) (Class V)	LF	1,220	\$ 125.00	\$ 152,500.00
6	24-Inch Reinforced Concrete Pipe (Complete In-Place) (Class III)	LF	115	\$ 135.00	\$ 15,525.00
7	24-Inch Reinforced Concrete Pipe (Complete In-Place) (Class V)	LF	845	\$ 150.00	\$ 126,750.00
8	30-Inch Reinforced Concrete Pipe (Complete In-Place) (Class III)	LF	105	\$ 150.00	\$ 15,750.00
9	36-Inch Reinforced Concrete Pipe (Complete In-Place) (Class V)	LF	355	\$ 200.00	\$ 71,000.00
10	48-Inch Reinforced Concrete Pipe (Complete In-Place) (Class V)	LF	175	\$ 300.00	\$ 52,500.00
11	54-Inch Reinforced Concrete Pipe (Complete In-Place) (Class V)	LF	175	\$ 400.00	\$ 70,000.00
12	18-Inch Reinforced Concrete End Section	EA	10	\$ 1,250.00	\$ 12,500.00
13	24-Inch Reinforced Concrete End Section	EA	4	\$ 1,500.00	\$ 6,000.00
14	30-Inch Reinforced Concrete End Section	EA	1	\$ 1,600.00	\$ 1,600.00
15	36-Inch Reinforced Concrete End Section	EA	4	\$ 1,750.00	\$ 7,000.00
16	48-Inch Reinforced Concrete End Section	EA	2	\$ 2,500.00	\$ 5,000.00
17	54-Inch Reinforced Concrete End Section	EA	4	\$ 3,500.00	\$ 14,000.00
18	Inlet Type C (5-Foot)	EA	8	\$ 5,000.00	\$ 40,000.00
19	Inlet Type C (10-Foot)	EA	2	\$ 7,500.00	\$ 15,000.00
20	Inlet Type D (10-Foot)	EA	1	\$ 10,000.00	\$ 10,000.00
21	Full-Spectrum Detention Basin	AC-FT	10.5	\$ 25,000.00	\$ 262,500.00
22	Erosion Control	LS	1.0	\$ 3,500.00	\$ 3,500.00
23	Demolition - Roadway and Drainage	LS	1	\$ 5,000.00	\$ 5,000.00
					\$ 1,031,225.00

NOTES

North drainage ditch widening
North drainage ditch lining
North drainage ditch erosion control (2-foot thickness along channel bottom)

Structures: PR-IN-200, PR-IN-201, PR-IN-202, PR-IN-203, PR-IN-204, PR-IN-205, PR-IN-206, PR-IN-207

Structures: PR-IN-208, PR-IN-209

Structures: PR-IN-210

OPTION 2 - UTILITY CORRIDOR					
ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	EXTENDED COST
1	Longmont Power and Comm Service Extension Allowance	LS	1	\$ 265,000.00	\$ 265,000.00
2	Electrical/Communications Ductbank (All Inclusive)	LF	6,290	\$ 35.00	\$ 220,150.00
3	4-Inch HDPE Gas Pipeline (All Inclusive)	LF	2,975	\$ 40.00	\$ 119,000.00
4	12-Inch PVC Watermain (All Inclusive)	LF	5,890	\$ 60.00	\$ 353,400.00
5	8-Inch Sanitary Gravity Sewer (All Inclusive) South Connection	LF	4,010	\$ 65.00	\$ 260,650.00
6	8-Inch Sanitary Gravity Sewer (All Inclusive) East Connection Additional Length	LF	1,140	\$ 65.00	\$ 74,100.00
					\$ 1,292,300.00

Jeff Winston quote [email 28 Dec 2016]

Bill Taylor quote

Bill Taylor quote