



Troy C. Holm

Lead Civil 3D Designer

Education

Associates, Computer-Aided Drafting and Design (CAD), 1994

Experience Summary

Mr. Holm has over 26 years of experience in CAD design, drafting, quantity calculation, 3D visualization, and animation in the Civil and Mining Engineering industries. His experience has been applied within the mining industry to tailings storage facilities (TSF), diversion channels, heap leach pads, waste rock storage facilities (WRSF), various ponds, building pads, pipeline layouts, plant design and layout, access and haul roads and sediment control channels, mining reserve estimation, and site and view-shed studies. In addition to an extensive background in CAD, he has produced numerous mine site animations and visualization projects for various sites domestically and internationally. He has extensive experience with civil design programs such as Autodesk Civil 3D, Autodesk 3DsMax, ArcGIS, Global Mapper, and Quicksurf. With a thorough background and understanding of drafting principles and expertise, including standardization and implementation of 3D terrain modeling, site grading, and analysis, Troy enables the provision of full-service CAD and visualization support through all stages of the engineering project from conceptual to As-Built.

Project Experience

Mine Tailings / Waste Facilities

TSF3 DAM RAISE DESIGNS, GOLDSTRIKE MINE | NEVADA

CAD design for TSF3 Stages 3, 4, and 5A tailings dam raise expansion designs, including embankment layout and optimization, grading plans, road crossings, pipeline corridors, emergency overflow channels, existing diversion relocation, drains, and sediment controls. (Vector Colorado, 2005; Tierra Group, 2018 to Present)

NORTH BLOCK TAILINGS DISPOSAL FACILITY (NBTFD) EXPANSION, GOLDSTRIKE MINE | NEVADA

CAD design for multiple expansion stages for the NBTFD, including relocating a portion of an existing diversion and optimizing tailings storage capacity with several geographic constraints such as property boundaries, ore stockpiles, adjacent TSFs, and processing facilities. (Tierra Group, 2018 to Present)

NEW JERSEY MILL TSF RAISE | IDAHO

Construction drawings and grading design for the New Jersey Mill TSF dam raise. (Tierra Group, 2021)

STIBNITE GOLD PROJECT | IDAHO

Stibnite Gold TSF and diversion channel design and grading plan. Prior to final design, assisted with the development of the feasibility-level designs. (Tierra Group, 2018 and 2020 to Present)

FIRE CREEK MINE | NEVADA

Closure cover design for the Fire Creek Mine WRSF. The design included open channel design, surface water modeling, and civil grading design. (Tierra Group, 2021)

FEKOLA | MALI

Initial grading layout for the Fekola waste disposal design. (Tierra Group, 2020)

SAN JOSE | NICARAGUA

Stage 4 TSF design and dam breach analysis. (Tierra Group, 2020)

SNOW CANYON CLOSURE DESIGN | NEVADA

Closure design for the Snow Canyon Rock Disposal Area (RDA). The design included geotechnical stability analyses, hydrology, hydraulic design of surface channels, and erosion and sediment control design. (Tierra Group, 2020)

SAN ALBINO | NICARAGUA

CAD design for a dry stack TSF. (Tierra Group, 2020)

NBTDF ROASTER CORRIDOR, GOLDSTRIKE MINE | NEVADA

CAD design for the NBTDF Roaster Corridor realignment. The project included modifications requiring an Engineering Design Change submittal for state approval. (Tierra Group, 2019 to 2021)

AA TSF CLOSURE PLAN, GOLDSTRIKE MINE | NEVADA

Designed a stacking plan for the final closure cover (up to 30 feet of fill) on the inactive tailings surface. (Tierra Group, 2020)

BENSON MINE | NEW YORK

Scoping level TSF design at the Benson Mine in St. Lawrence County, New York. (Tierra Group, 2020)

GYPSUM MINE | COLORADO

Designed life-of-mine staged layouts, including developing multiple options for new and existing pits, haul and access roads, waste storage, sediment controls, and reclamation grading. (Tierra Group, 2017 and 2019 to 2020)

SWEETWATER TSF RAISE DESIGN | MISSOURI

CAD design for two TSF raises for a 40+-year-old TSF at the Sweetwater Mine. A design raise to the existing spillway was approved by Missouri Department of Natural Resources (MDNR) Dam and Reservoir Safety Council in March 2016. A second raise (23 feet tall) included a rockfill buttress, saddle dam, and a new spillway. (Tierra Group, 2017 to 2018)

KEMMERER | NEVADA

Kemmerer realignment design for the diversion reporting to the IA permanent impoundment. (Tierra Group, 2018)

PRE-FEASIBILITY LEVEL TSF, MT. TODD GOLD MINE | AUSTRALIA

CAD design for two separate pre-feasibility level studies involving raising an existing facility and constructing a new facility. Preliminary designs included underdrain and overdrain systems, toe drains, piping plans, and surface water diversion. (Tetra Tech, 2008 and 2010)

TOURNIGAN MINING OPERATION ANIMATION | SLOVAKIA

Produced a mine operation animation for the proposed Tournigan Uranium Mine in Slovakia. The project included an interactive flash program to better educate the public on the overall process and purpose of uranium mining and the energy process. (Tetra Tech, 2010)

PUMPKIN HOLLOW | NEVADA

CAD design and yearly phasing of a phased dry stack TSF. (Vector Colorado, 2009)

LA LIBERTAD MINE, LA ESPERANZA TSF | LA LIBERTAD, NICARAGUA

CAD design and drawings for a downstream-raised, geosynthetic-lined TSF using a mechanically stabilized earth (MSE) wall to vertically raise the dam crest. (Tetra Tech, 2008)

CHINCHÁN SOUTH DRY STACK TSF | SAN MATEO, PERÚ

CAD design and drawings for a dry stack TSF. (Tetra Tech, 2008)

PAREDONES-AMARILLOS MINE-LIFE CYCLE ANIMATION | MEXICO

Produced a life-of-mine animation of the proposed Paredones' Mine life on the Baja Peninsula. (Tetra Tech, 2008)

LUCKY JACK MINE LIFE ANIMATION | COLORADO

Produced a mine life animation for the proposed Lucky Jack Mine site, which was used for public relations and to assist regulators in reviewing the Environmental Impact Assessment (EIA). (SRK, 2007)

AKYEM MINE LIFE ANIMATION | GHANA

Produced a mine life animation for the proposed Akyem Mine site used for public relations and to assist regulators in reviewing the EIA. Included three physical models of the site with inserts of models to depict time periods in the mine's life. (Vector Colorado, 2006)

TAILINGS AND WASTE ROCK IMPOUNDMENT | ARIZONA

CAD design and drawings for a proposed staged tailings and waste rock co-disposal facility. Viewshed analysis and 3D animation of a site drive-by from a scenic highway to show visual impact and progressive reclamation of side slopes. (Vector Colorado, 2005)

PASCUA LAMA TAILINGS IMPOUNDMENT | ARGENTINA

CAD design and drawings for a TSF in the Andes Mountains between Argentina and Chile. (Vector Colorado, 2005)

CANARIACO TSF | PERÚ

CAD design and siting for the proposed Canariaco TSF. (Vector Colorado, 2005)

EL LIMON TAILINGS IMPOUNDMENT | NICARAGUA

CAD design and drawings for the MSE vertical expansion of the El Limon TSF. (Vector Colorado, 2005)

PASCUA LAMA PROJECT STABILITY ANALYSES | WESTERN ARGENTINA

CAD design and drawings for a tailings dam and a water storage dam located in the high Andes near the Chile-Argentina border. (Vector Colorado, 2005)

EL DORADO TAILINGS IMPOUNDMENT | EL SALVADOR

CAD design and drawings for the El Dorado TSF (the first TSF permitted in El Salvador). Produced a mine life animation for this site which was used for public relations and to assist regulators in reviewing the EIA. (Vector Colorado, 2004)

SOLEDAD TAILINGS IMPOUNDMENT | HONDURAS

CAD design and drawings for the Soledad tailings impoundment and facilities. (Vector Colorado, 2003)

POZO AZUL TAILINGS IMPOUNDMENT | HONDURAS

CAD design and drawings for various design stages of the Pozo Azul TSF. Produced a life cycle animation of the Pozo Azul TSF for use in a Tailings Mine Waste 2002 presentation. (Olsson Associates, 2002)

Heap Leach Facilities

BELLAVISTA | COSTA RICA

CAD drawings for heap leach landslide mitigation. (Tetra Tech, 2008)

HEAP LEACH FACILITY PRELIMINARY DESIGN | ARIZONA

Preliminary design drawings and quantity calculations of a heap leach facility. (Vector Colorado, 2004)

Hydraulics / Hydrology

EVAPORATION PONDS DESIGN, McLAUGHLIN MINE | CALIFORNIA

CAD design, earthworks grading, and issued for construction drawings for the evaporation ponds. (Tierra Group, 2021)

MISSION MINE | ARIZONA

Stormwater design. (Tierra Group, 2020)

TAILINGS IMPOUNDMENT FACILITY (TIF) DIVERSION CHANNEL, McLAUGHLIN MINE | CALIFORNIA

TIF Diversion Channel re-establishment design. (Tierra Group, 2020)

FIRE CREEK MINE | CALIFORNIA

Grading design for converting existing infiltration ponds to double-lined process water storage ponds with leakage collection sumps. (Tierra Group, 2020)

STIBNITE GOLD PROJECT | IDAHO

Diversion channel design trade-off options for the Stibnite site. (Tierra Group, 2018)

SITE IMPROVEMENTS, MCLAUGHLIN MINE | CALIFORNIA

CAD design for multiple diversion, erosion, and pond improvements. (Tierra Group, 2017)

GYP SUM MINE | COLORADO

CAD design for sediment control pond and mitigation. (Tierra Group, 2017)

LEEVILLE PASTE BACKFILL PLANT | NEVADA

3D modeling and construction drawings for tanks, piping routing, and components for constructing a paste backfill plant at the Leeville Mine Site. (Paterson & Cooke, 2016)

PHOSPHATE PROJECT | SAUDI ARABIA

3D model and feasibility layout drawings of tanks, conveyors, cyclones, thickeners, pumps, and pipe routing for a conveyed filtered tailings system. (Paterson & Cooke, 2015)

HYCROFT GOLD & SILVER MINE | NEVADA

Detailed design drawings of a tailings delivery system with two operating pump trains. (Paterson & Cooke, 2012)

CHESAPEAKE | MEXICO

Feasibility design drawings for long-distance slurry and water pipelines. (Paterson & Cooke, 2011)

Presentations / Publications

Holm T (Co-Author), 2005. *Virtual Reality Animation of The Proposed El Dorado Mine In El Salvador Assists Regulators in Reviewing An EIA*. SME Annual Meeting 28 February – 2 March 2005, Salt Lake City, Utah.

Employment History

CURRENT EMPLOYER	TIERRA GROUP INTERNATIONAL, LTD.
POSITION	Lead Civil 3D Designer
YEARS	2016 to Present
EMPLOYER	PATERSON & COOKE
POSITION	CAD Manager
YEARS	2011 to 2016
EMPLOYER	SELF-EMPLOYED
POSITION	CAD Design Consultant
YEARS	2006 to 2011
EMPLOYER	VECTOR COLORADO, LLC
POSITION	Lead CAD Designer/Animator
YEARS	2003 to 2006

EMPLOYER	OLSSON ASSOCIATES
POSITION	Lead CAD Designer
YEARS	2001 to 2003
EMPLOYER	MONTGOMERY WATSON
POSITION	CAD Designer
YEARS	1999 to 2001
EMPLOYER	STEFFEN ROBERTSON AND KIRSTEN (U.S.), INC.
POSITION	Computer Aided Draftsman
YEARS	1996 to 1999
EMPLOYER	THIRD COAST ARCHITECTS
POSITION	Computer Aided Draftsman
YEARS	1994 to 1996