

# Construction Machinery

## 1 ZX135USX-6 ICT Hydraulic Excavator

ZX135USX-6 is a hydraulic excavator designed for use in small construction projects that incorporates information and communication technology (ICT). It has been released for the Japanese market and complies with the 2014 standards specified in Japan's Off-road Act. It was designed as a refinement of the ZX135US-6 (a hydraulic excavator with a small turn radius) and comes with Hitachi's solution linkage assist system. This system uses data to assist work operations and provides the same machine guidance and machine control features as the ZX200X-6. The excavator's main features are as follows:

- (1) The machine guidance system displays position relationships and posture information for the excavator body and work objective. It has an easy-to-use dedicated touch panel monitor and highly responsive posture sensors.
- (2) The machine control system uses work objective data to provide semi-automatic control of the excavator body. Its main function prevents over-digging of the work objective by controlling the bucket. It also has a bucket angle lock mode that keeps the bucket angle constant. The precision of these features has been improved through market feedback about user needs received for previous models.
- (3) The excavator is connected to solution linkage cloud, a cloud service from Hitachi Construction Machinery Co., Ltd. (a provider of optimum solutions for the i-Construction\* initiative led by the Ministry of Land, Infrastructure, Transport and Tourism). The service enables access to applications useful for ICT-based construction work.

(Hitachi Construction Machinery Co., Ltd.)

\* See "Trademarks" on page 158.



1 ZX135USX-6 ICT hydraulic excavator

## 2 ZH120-6 Hybrid Hydraulic Excavator

ZH120-6 is a hybrid hydraulic excavator that reduces fuel consumption by 6% relative to standard hydraulic excavators. It has been released for the Japanese market and complies with the 2014 standards specified in Japan's Off-road Act.

The product is the industry's first hybrid hydraulic excavator in the 12-metric-ton class. It comes with HIOS IV-HX, a new hybrid hydraulic regeneration system developed by drawing on Hitachi Construction Machinery's accumulated portfolio of technologies. The excavator's main features are as follows:

(1) The new hybrid system provides highly fuel-efficient performance. The energy used to lower the boom is hydraulically regenerated by an accumulator. The stored pressure is used to save engine power by assisting front operations and operation circuits.

(2) The exhaust gas recirculation (EGR) system has been improved to further reduce nitrogen oxide (NOx) emission levels. EGR systems reduce running costs other than fuel by eliminating the need to supply the urea solution needed by models using urea-based selective catalytic reduction (SCR) systems.

(Hitachi Construction Machinery Co., Ltd.)



2 ZH120-6 hybrid hydraulic excavator

## 3 ZX35U-5B Mini-excavator with Blade Machine Control

Hitachi has developed a mini-excavator system that uses a blade having a power angle tilt (PAT) mechanism designed for mini-excavators. The system also provides a three-dimensional (3D) machine control function using 3D design data to control complex movements.

Small-motor graders, small bulldozers, and similar construction machinery has traditionally handled the bulk of roadbed work for playing fields and parking lots, and ground leveling for community roads and other small-scale top-surface roadbed engineering work. But since this work takes highly skilled operators to control the equipment, declining productivity is becoming a serious issue as Japan's construction industry workforce is expected to continue shrinking in the years ahead. The result will be a dwindling number of skilled operators with mastery of small-motor grader and small bulldozer operation.

The PAT blade-based 3D machine control function was developed to address this issue. It enables efficient finishing work on the work objective surface using equipment such as sensors and controllers made by a number of different measuring instrument manufacturers. This equipment uses machinery position information to provide semi-automatic control of blade work in real time in accordance with 3D design data. The function greatly reduces the time previously spent on inspection and other work processes. It also helps increase ground leveling work efficiency, site safety, and site productivity

(Hitachi Construction Machinery Co., Ltd.)



3 ZAXIS35U-5B mini-excavator with power-angle-tilt (PAT) blade

## 4 EH5000AC-3 Rigid Dump Truck with Trolley System

This model adds trolley mode to the EH5000AC-3 alternating current (AC) drive rigid dump truck (nominal payload: 296 tonnes, target gross machine operating weight: 500 tonnes) that was launched in February 2013. Following the EH3500AC-3 and EH4000AC-3, the launch of the EH5000AC-3 with trolley system (trolley trucks) completes the lineup of the AC drive rigid dump truck series with trolley system. The product's main features are as follows:

- (1) The trolley trucks make it possible to maintain low engine rotation during trolley mode, reducing fuel consumption compared with the standard EH5000AC-3 rigid dump trucks.
  - (2) When travelling on uphill slopes with load, trolley mode enables approximately two times the travel speed than normal diesel engine mode. This reduces cycle time, and contributes to the improvement of production.
  - (3) In trolley mode, the trolley trucks can maintain low engine rotation and reduce engine load. This benefit enables less-frequent engine overhauls, lowering maintenance expenses.
  - (4) The trolley truck's ability to reduce engine load in trolley mode reduces the environmental impact by lowering carbon dioxide (CO<sub>2</sub>) emissions from the machine.
  - (5) The trolley system is also available as an aftermarket addition, enabling standard rigid dump trucks to be upgraded to trolley trucks as power generation facilities and overhead wiring equipment are completed.
- (Hitachi Construction Machinery Co., Ltd.)



4 EH5000AC-3 rigid dump truck with trolley system

## 5 ConSite (ConSite Oil, ConSite Pocket, and ConSite Shot)

There has been a shift in customer concerns over recent years toward reducing lifecycle costs and improving machine availability. Hitachi Construction Machinery provides consistent high-quality services to customers around the world using ConSite, a next-generation service solution utilizing ICT.

### (1) ConSite smartphone application

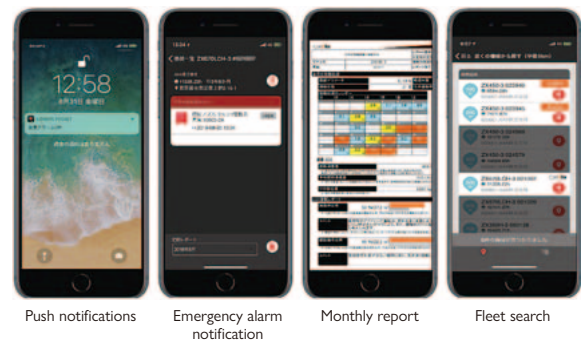
In November 2017, the company first launched the “ConSite Pocket” smartphone application as an advanced solution of the “ConSite Data Report Service” for customers and dealers. In April 2018, this application was offered in 33 languages worldwide.

In addition, the company provides “ConSite Shot” for assisting official Hitachi dealers in delivering consistent, high-quality inspection service to its customers. As a result, Japanese domestic dealers achieved 150% improvement in the number of inspection reports provided to customers compared to the same period last year.

### (2) ConSite oil sensor

The industry's first lubricant monitoring sensor was launched as the next-generation remote monitoring service in October 2017. 24-hour/365-day oil monitoring and diagnostic solutions are offered as standard options in the European and Japanese markets.

(Hitachi Construction Machinery Co., Ltd.)



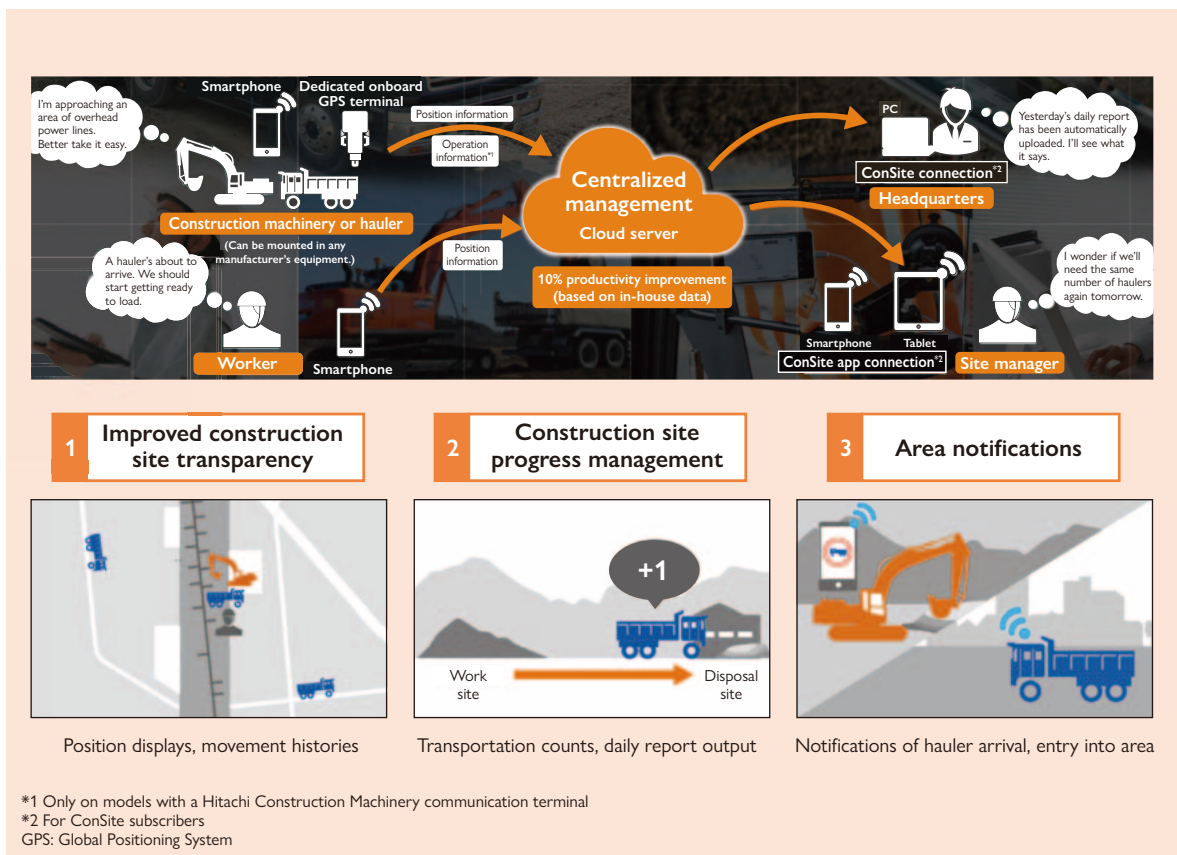
5 ConSite Pocket smartphone app for customers developed in-house

## 6 Construction Solution Using Mobile Devices

Hitachi has released a new construction solution that uses mobile devices to let construction sites easily create an Internet of Things (IoT) environment. With Japan's construction industry struggling to cope with increasingly severe labor shortages, the solution was released in April 2018 as a way to tackle problems that sites have been unable to solve with conventional information technology. An original solution has been created through the process of collaborative creation with customers. It is a strategy used to gain a competitive edge designed to acquire close and reliable partners. Specifically, the solution improves customer productivity and safety by providing increased construction site transparency, progress management, area notifications, and similar functions.

The solution acquires position information from smartphones or dedicated onboard Global Positioning System (GPS) terminals mounted in construction machinery and haulers. It helps improve the work efficiency of the overall site in a number of ways. For example, work progress analyzed from the local position or position information can be checked on a smartphone or PC screen by a site manager. The manager can then use the information to study the next setup. Site workers can receive hauler arrival notifications on smartphones, allowing them to start getting ready.

(Hitachi Construction Machinery Co., Ltd.)



6 System overview and basic functions of new construction solution